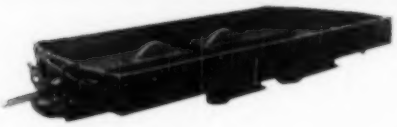
Coal Age

WHAT'S AHEAD IN LABOR ... p 62

Pleasant View Mining and Preparation • Gas-Filled Transformers • Moving Osage Strip • German Coal Planer • Solving Anthracite Dewatering Problem

Don't put all your coal in one basket, either!

You're a lot safer with a Mine Car haulage system!

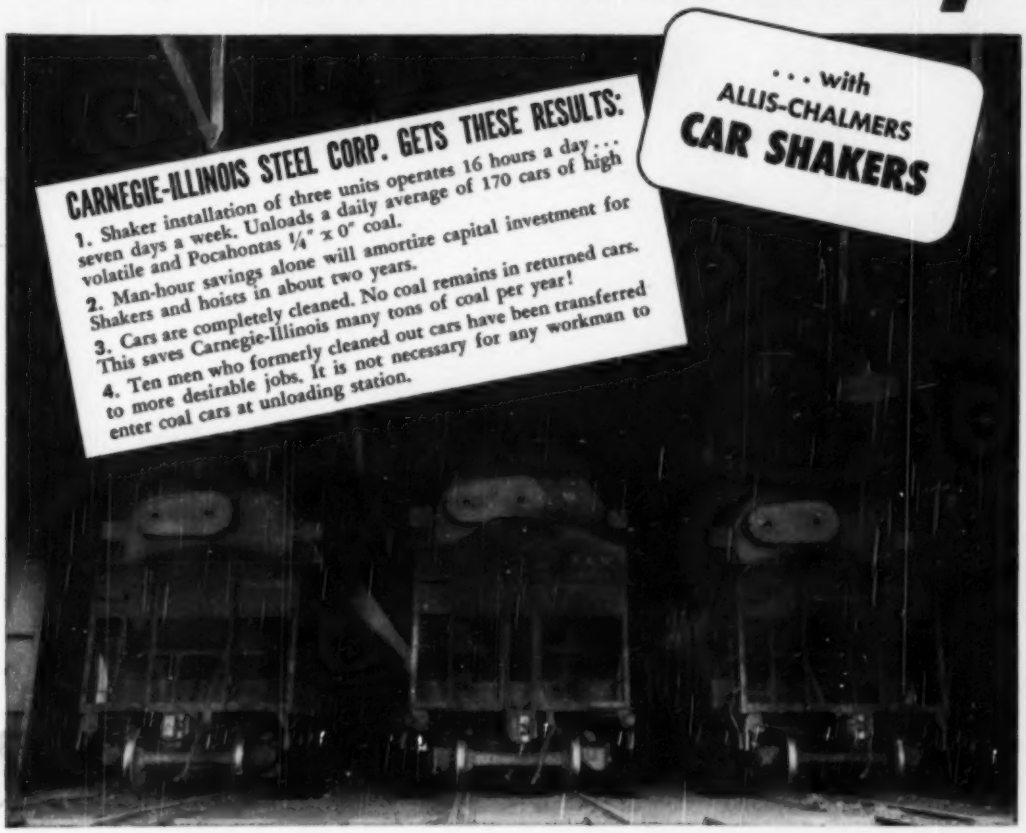


Sure, you may have some mine car repairs to make every once in a while . . . same as you will with *any* machinery. But does that stop your coal from moving? *Not with mine cars!* The one car you want to fix is shunted onto a siding. Most of the time it's fixed right there by your own maintenance men . . . *cheaply* and *quickly*. The *rest* of the trip rolls right along, *and so does your coal*. Your cutters, loaders, processing machinery, *men* . . . all keep producing. Your coal keeps moving without interruption. *Only with constant haulage mine cars can you eliminate the chance of long, serious, costly haulage breakdowns.* Your nearby A.C.F. Sales Representative can help you with planning any changes in your haulage systems. Call him in today. American Car and Foundry Company, New York • Chicago • St. Louis • Cleveland Philadelphia • Washington • Huntington, W. Va. San Francisco • Pittsburgh • Berwick, Pa.

a.C.f. MINE CARS

for Constant Haulage

STEEL MILL UNLOADS
170 Coal Cars Daily!



YOU CAN GET SIMILAR SAVINGS in demurrage charges and man-hours by installing an Allis-Chalmers Car Shaker. And you save with safety! Accidents are eliminated as workmen do not have to mount the car during the automatic unloading operation.

The Shaker is driven by a 15 hp, high torque, integrally enclosed Allis-Chalmers motor — mounted on rubber to protect motor from severe vibration.

For complete information on how the Car Shaker can help *you* save time and money, contact your nearby A-C Sales Office. Or write for Bulletin 07B7221.

ALLIS-CHALMERS, 968A SO. 70 ST.
MILWAUKEE, WIS.

Please send Car Shaker Bulletin 07B7221.

Name

Title

Firm

Address A-3171

ALLIS-CHALMERS

The Champion

SHORE'S
BROWNIE DOONE
Champion
Bird Dog
1950

The six-year-old pointer dog, Shore's Brownie Doone, owned by Mr. Gerald M. Livingston, and ably handled by Mr. George A. Evans, Jr., won the National Field Trial Champion Association's 52-year-old field trial classic over the historic Hobart Ames Plantation near Grand Junction, Tennessee. The spectacular trials were held between February 20 and March 1, 1950, and included 31 starters. Dogs are judged for ability to search for and find and point to coveys of quail — also for accuracy, for steadiness as birds take wing and gun is fired. In three hours Brownie Doone found nine well spaced coveys of quail, handling them perfectly with impeccably styled and postured points, winning the highest place in the field-trial show with one of the best performances seen in the past 20 years.

HULBURT OIL & GREASE COMPANY, PHILADELPHIA, PA.
Specialists in Coal Mine Lubrication

The Champion

...IN COAL MINE LUBRICATION

Hulburt Quality GREASE

"The Champion"

Maybe you'd like to do some pointing yourself . . . for instance, you can point with pride to steadily running mining machines, operating productively without interruption . . . when you lubricate them with Hulburt Quality Grease. Use this Grease, and your machines won't quail at hard going or fall through lubrication troubles. Don't let repairs and delays dog you—let a Hulburt Lubrication Engineer "nose out" your trouble spots underground and watch them take wing! Hulburt Grease QUALITY is the point to remember.

THIS MONTH'S COVER

• SIXTH IN THE SERIES of company-erected all-welded plants, the new Chieftan No. 20 preparation plant of the Maumee Collieries Co., Riley, Ind., has a rated capacity of 600 tph of raw feed and utilizes jig and trough washing equipment, centrifugal and heat driers and oil treatment to assure maximum quality, uniformity and consumer satisfaction. It replaces the first of the company's welded plants, completed in 1932 on the same site.

COMING IN COAL AGE

• **IF YOU'RE ON THE LOOKOUT** for useful cost-cutting efficiency-boosting ideas, keeping your eye on COAL AGE will pay off handsomely. Here are just a few of the many practical operating stories coming your way soon.

• **How Knight-Ideal** keys its entry development and room production to seasonal market demands in thick-seam mining in Utah.

• **Stripping and preparation** at the new 2,000-tpd Buffalo Creek No. 19 mine of the United Electric Coal Cos., St. Charles, Ky.

• **Modernizing haulage** at Gay Coal & Coke not only reduces haulage costs and betters efficiency but recovers considerable coal formerly lost.

• **How kerosene flotation** is effectively cleaning fine coal at two Alabama operations of the Sloss-Sheffield Steel & Iron Co.

• **Difficult top conditions** are no bar to real safety achievement when you use DeAngelis Coal's methods for recovering anthracite pillars in caved ground.

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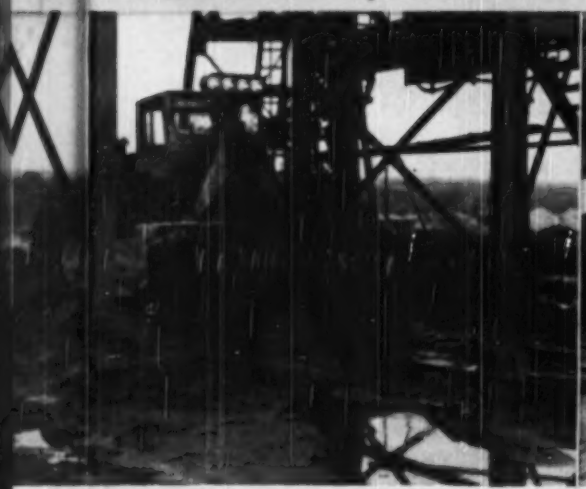
1 TOURNADOZER

Maintains Haul Roads — Rugged, 2½-yard blade, plus high-speed operation, enable Tournadozer to maintain haul roads, fill washouts, grade shoulders . . . at working speeds up to 3 times faster than conventional slow-moving crawlers.

Skids Equipment — Four-wheel drive on 21.00 x 25 low-pressure tires provides ample power and traction for hauling heavy equipment around the pit. Here, Super C Tournadozer quickly maneuvers cable boat for large stripping shovel.



Cleans Tracks — Mobile "C" moves in fast from other assignments to clean up ore spilled near hopper. Tournadozer can cross tracks or follow rail lines anywhere, without planking. Big, rubber tires prevent damage to rails, leave no chamfered or gouged ties.

Spots Railway Cars — Rubber-tired Tournadozer is handy for moving cars in yards or on siding. Can push or snake with cable. Here versatile Tournadozer spots empty railcars under ore loader for this Mesabi Iron Range mining company.

LET®

See your Le Tourneau Distributor NOW for complete information

handles 7 assignments

in typical day at Mesabi Mine

Dozes Overburden — Tournadozer's sure four-wheel traction, multiple-disc air brakes, and fast-acting electric blade controls permit it to work safely near the edge of spoil bank. Operator sits up front ahead of engine, has full visibility in all directions.

Near Keewatin, Minnesota, one high-speed, rubber-tired C Tournadozer profitably performs a variety of widely scattered jobs for a Mesabi Range mining operation. During a typical 24-hour day in the company's 7-day work week, Tournadozer maintains spoil dump . . . dozes overburden . . . cleans spillage from stripping shovels and haul units . . . skids electric cable boats . . . switches railroad cars. And, the many extra uses for the high-speed Tournadozer are still increasing daily.

Saves Several Hours in Job-to-Job Moves Alone

Routine job trips around the mine vary from ¼ mile to 7/10 mile. On the longer trips to other areas, fast, rubber-tired "C" takes the shortest route — over paved roads. It doesn't have to take the long, unimproved back road route their crawlers must use. There is no roadbed on which the Tournadozer is prohibited. The Tournadozer's "work-and-get-around-ability" saves up to two hours each trip . . . uses the hours saved for *extra* assignments around the mine. Tournadozer not only gets places faster . . . but it makes twice as many dozing cycles on the job as ordinary crawlers.

Faster on any Dozing Job

Fast, mobile Tournadozer handles multiple assignments for this Minnesota company, and will for *you*, too. For complete information on this Super C Dozer, write or phone your LeTourneau Distributor. He is ready to show what this job-proved unit can do on your work. Ask him for facts and figures on the many Tournadozer uses TODAY.

Tournadozer-Trademark Reg. U. S. Pat. Off. M22

LETOURNEAU PEORIA, ILLINOIS — JOB-PROVED The World Over — **TOURNADOZERS**

IT'S RUBBER THAT PUTS THE ACTION IN TRACTION

A HEAVY-DUTY MOTOR GRADER in every respect — designed and engineered to stand up under any going, to take more punishment, get more work done with less power effort. Some reasons for the AD-4's outstanding performance on every job:

POWERFUL—104 brake hp. . . . General Motors 2-Cycle Diesel Engine . . . dependable, compact, economical, instant starting.

HEAVY— 22,140 lb. effective weight . . . balanced for maximum traction and control.

STRONG—exclusive tubular frame . . . absorbs shocks, protects control rods inside frame.

ACCURATE— blade held firmly on work through direct down pressure . . . smoother cutting.

"ROLL-AWAY" MOLDBOARD — the moldboard that moves material the easiest way . . . by *rolling* it.

TRAVEL SPEEDS smoothly synchronized with operator controls . . . all the needed power applied as required.

HIGH CLEARANCE under circle and axle to handle bigger windrows.

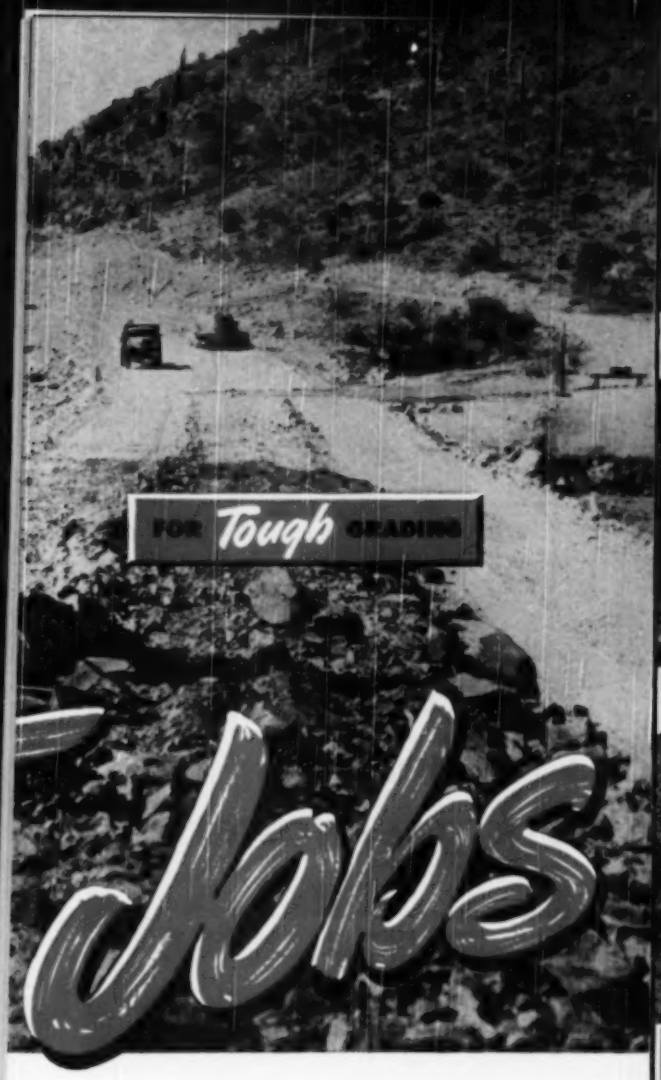
FULL CIRCLE REVOLVING BLADE—swings *ahead* of platform with plenty of end clearance.

FULL RANGE OF BLADE POSITIONS—plus leaning front wheels, for handling all types of grading with ease.

LIQUID-WEIGHTED TIRES ON DRIVING WHEELS puts more weight on the ground — *where it belongs* . . . enables you to work on steeper slopes. Better traction, smoother riding, less tire wear!

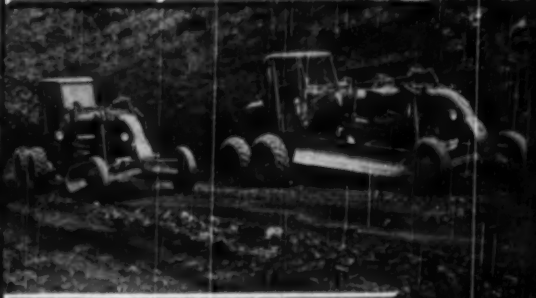
PLUS... easier steering, full visibility, larger clutch, numerous other advantages.

"Seeing Is Believing." **Get the full story from your Allis-Chalmers dealer . . . *NOW!***



FOR Tough MAINTENANCE

FOR Tough DITCHING



FOR Tough SCARIFYING

FOR Tough SNOW PLOWING

CHOOSE THE RIGHT SIZE ALLIS-CHALMERS GRADER TO FIT YOUR NEEDS FROM THIS COMPLETE LINE

Model	Brake Hp.	Engine
AD-4	104	2-Cycle Diesel
AD-3	78	2-Cycle Diesel
BD-3	78	2-Cycle Diesel
BD-2	50.5	2-Cycle Diesel
D	34.7	Gasoline

"Roll-Away" is an Allis-Chalmers trademark.

ALLIS-CHALMERS

TRACTOR DIVISION • • MILWAUKEE 1, U. S. A.

FOR GREATER PRODUCTION
FOR EASIER OPERATION
FOR SIMPLIFIED SERVICING

Your money goes farther . . . your work goes faster!

These are the famous Advance-Design features that help make

CHEVROLET TRUCKS AMERICA'S FIRST CHOICE!

TWO GREAT VALVE-IN-HEAD ENGINES: the 105-h.p. Loadmaster or the improved 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—smoother, quicker acceleration response • DIAPHRAGM SPRING CLUTCH for easy-action engagement • SYNCHRO-MESH TRANSMISSIONS for fast, smooth shifting • HYPOID REAR AXLES—for dependability and long life • DOUBLE-ARTICULATED BRAKES—for complete driver control • WIDE-BASE WHEELS for increased tire mileage • BALL-TYPE STEERING for easier handling • UNIT-DESIGN BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

You're money ahead with Chevrolet trucks, for Chevrolet is the lowest priced line of all—and offers exceptional savings in on-the-job operating cost and in cost of maintenance, too.

And, you're money ahead with Chevrolet's special features. Chevrolet features like Valve-in-Head engine, Power-Jet carburetor and many others exclusive in the field.

You're money ahead because Chevrolet has a model built for your job . . . a truck engineered to the special requirements of that job and built to do it faster, better, more efficiently.

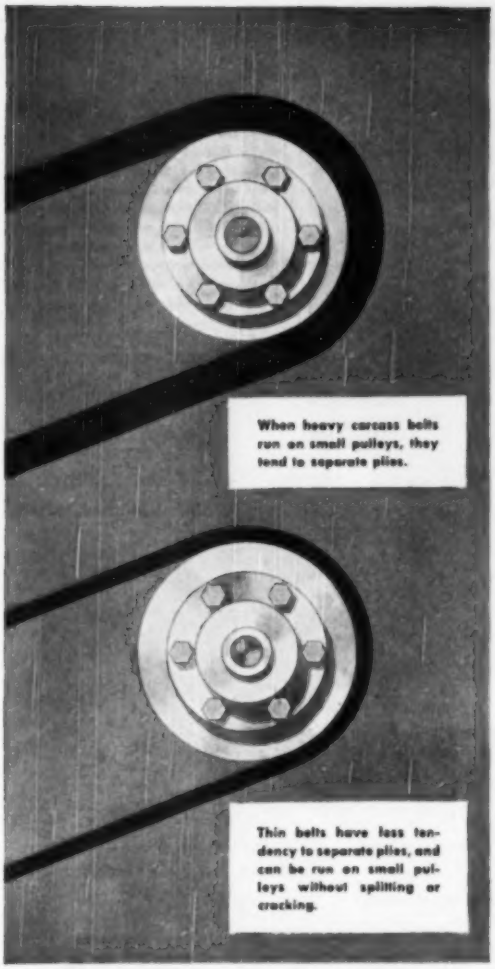
Yes, your money goes farther . . . your work goes faster with Chevrolet trucks. Let your dealer tell you all the details. Let him *prove* that *you're money ahead* with Chevrolet.

CHEVROLET MOTOR DIVISION, *General Motors Corporation*
DETROIT 2, MICHIGAN

CHEVROLET

First in demand
First in value
First in sales

CHEVROLET *ADVANCE-DESIGN* TRUCKS



MORE FLEXIBILITY. Belts built with "Cordura" have less tendency to crack and separate plies when run over small pulleys required in confined working space. And belts built with "Cordura" have less stretch, so less take-up room is needed. In addition, they trough well under any loading conditions.

OPERATING ECONOMIES YOU CAN GET FROM YOUR NEXT CONVEYOR BELT

Before you buy your next conveyor belt, be sure to consider the new belts built on Du Pont Cordura* High Tenacity Rayon. Belts sinewed with "Cordura" offer you many operating advantages . . . yet *cost no more.*

Just as sinews of "Cordura" make possible thinner yet stronger truck tires, they now give you a conveyor belt that is lighter and more efficient.

That's because "Cordura" is inherently stronger than natural fibers commonly used. And it is made in continuous filaments . . . with no short ends to pull apart under strain.

We'll be glad to send you the names of suppliers of the new belts built on "Cordura." We'll also give you full information about "Cordura" in the new booklet "Sinews for Industry." It describes the physical properties of "Cordura," how it has been used in many successful applications, and tells how "Cordura" improves the efficiency of conveyor systems. For your free copy, address Room 4527, Rayon Div., E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

*REG. U. S. PAT. OFF.

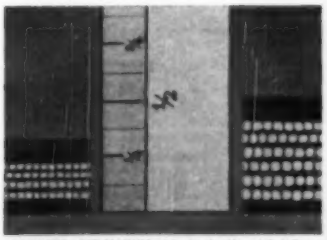
DU PONT "CORDURA" HIGH TENACITY RAYON

DU PONT

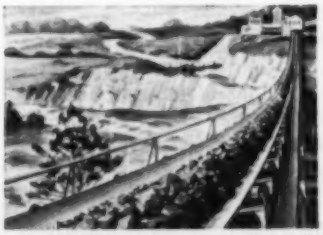
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

for RAYON . . . for NYLON . . . for fibers to come look to DU PONT

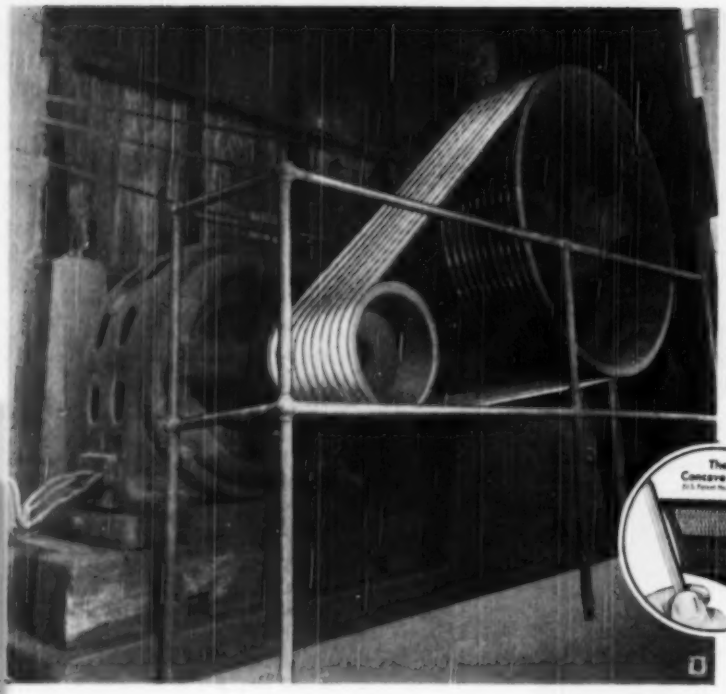


GREATER STRENGTH of belts built with "Cordura" is illustrated above. At left is cross-section of four-ply belt sinewed with "Cordura." It's stronger than conventional six-ply belt at right, yet only half as thick. This thin, light belt is particularly desirable where panel equipment is moved frequently.



SPAN LONGER LIFTS. The high tensile strength of "Cordura" rayon eliminates costly transfer points. For example, a belt reinforced with seven plies of "Cordura" can lift 1000 tons of overburden per hour up a 15° slope over 1000-foot centers. It has design tension of 900 pounds per inch of width.

HEAVIER LOADING CAPACITY is possible on conveyor belts built with Du Pont "Cordura" High Tenacity Rayon. This yarn is inherently stronger than the natural fibers commonly used. It packs extra strength into conveyor belts and enables them to carry loads to the capacity of power equipment.



In many smelters, poisonous fumes from the "sintering" of ore must be drawn through a precipitation machine by a large fan. Should this fan fail, the plant has to be shut down at once. The photo shows how a Utah smelter has safeguarded itself against this possibility by installing a multiple V-Belt Drive on this important fan. The original ropes on the drive are still good after operating 16 hours daily for 12 years.

If you want LOWER V-BELT COSTS, just make this simple test!

Just pick up *any* V-Belt and bend it—exactly as it bends when going around its pulley—and *see what happens!*

The top of the belt is put under tension; hence it grows *narrower.* The body the belt is under compression and *bulges out.*

This change of shape, due to bending a *straight-sided* V-Belt, is shown in figures 1 and 1-A. Note how the bulging sides are forced to press *unevenly* against the V-pulley. This naturally causes uneven wear on the sides—*concentrated wear* where the bulge is greatest.

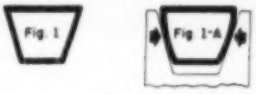
Now look at figures 2 and 2-A. There you see how the bending changes the shape of the V-Belt that is built with the Concave Side—the Gates Vulco Rope. The precisely engineered concave side of this belt merely *fill out* and become perfectly straight. There is no side-bulge. This belt, when bent, *precisely fits its sheave groove.*

Because there is *no bulging,* the sides of the Gates Vulco Rope always press *evenly* against the V-pulley and therefore wear *uniformly* —resulting in *longer belt life* and *lower belt costs for you.*

Only V-Belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure that you get the V-Belt with the Concave Sides—The Gates Vulco Rope!

What Happens When a V-Belt Bends

Straight-Sided V-Belt



How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear at Point Shown by Arrows.

Gates Vulco Rope with Concave Side

The Concave Side Fills Out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley — Uniform Wear!—Longer Life!

CS-5011

GATES VULCO ROPE DRIVES

Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

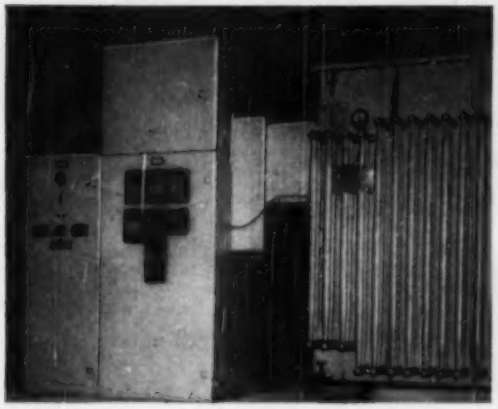
THE GATES RUBBER COMPANY
DENVER, U.S.A.
The World's Largest Makers of V-Belts

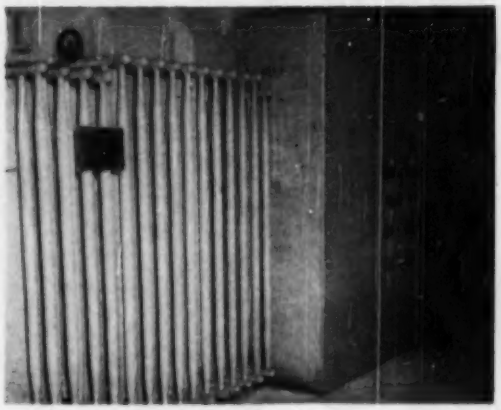
Island Creek saves 3 ways with G-E Rectifier!

Mercury-Arc Rectifiers
—to cut mining costs!

Installation costs cut! In installing this G-E 300-kw mining-type rectifier, Island Creek Coal Co. saved an estimated $140 by eliminating special foundations, cable ducts, etc. needed with rotating converters. Completely automatic in operation, G-E rectifiers can be placed in remote locations, without constant attendance. Use of shorter d-c lines is made possible, and voltage drop is reduced.

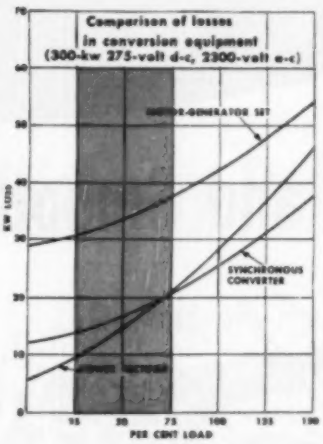
General Electric mining-type rectifier at Island Creek Coal Co., Holden, W. Va., saves an estimated $220 power cost and $250 maintenance cost every year—plus installation savings of $140!





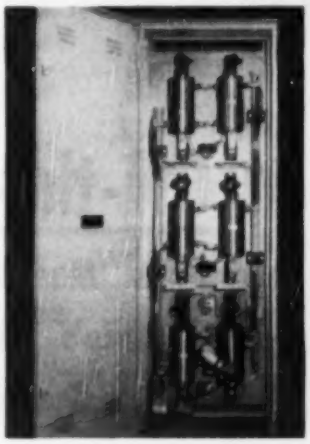
Personnel protected! To minimize the possibility of personnel coming into accidental contact with live parts, all units are deadfront, completely metal enclosed. Shown above are incoming a-c switchgear section and part of power transformer section. (At right: Rest of power transformer section, plus rectifier section and d-c switchgear section.)

Downtime reduced! A G-E rectifier has no major rotating parts to wear and interrupt service for replacement or cleaning. Protective devices automatically trip it off in case of a fault, minimizing downtime caused by damage to equipment. With full voltage at the face, mining machines operate more efficiently, with fewer interruptions.



Power costs cut! (left) Average mining load varies from 25 to 75 per cent of the conversion equipment's rating. In this range, as chart shows, power rectifiers have higher conversion efficiency than rotating machines. Island Creek Coal Co. estimates power savings at $220 annually from one G-E 300-kw rectifier alone.

Maintenance costs cut! (right) Steel panels isolate firing circuits from tubes and water cooling system, protecting electrical components. Rectifier unit has easily accessible parts, needs only an infrequent tube replacement and addition of water in the cooling system. Island Creek Coal Co. calculates its maintenance savings at $250 per year on one G-E rectifier.



SERVICE-PROVED! Over 250 G-E sealed tube mercury-arc rectifiers for mining service, in both stationary and portable types, are now in use throughout the country, some for more than 12 years. For more detailed information, write for new bulletin GEA-4047, or check with your nearest G-E office. *Apparatus Dept., General Electric Company, Schenectady, N. Y.*

GENERAL ELECTRIC

663-10

THE GREAT NEW *Mid-Century* U.S. ROYAL FLEETMASTER

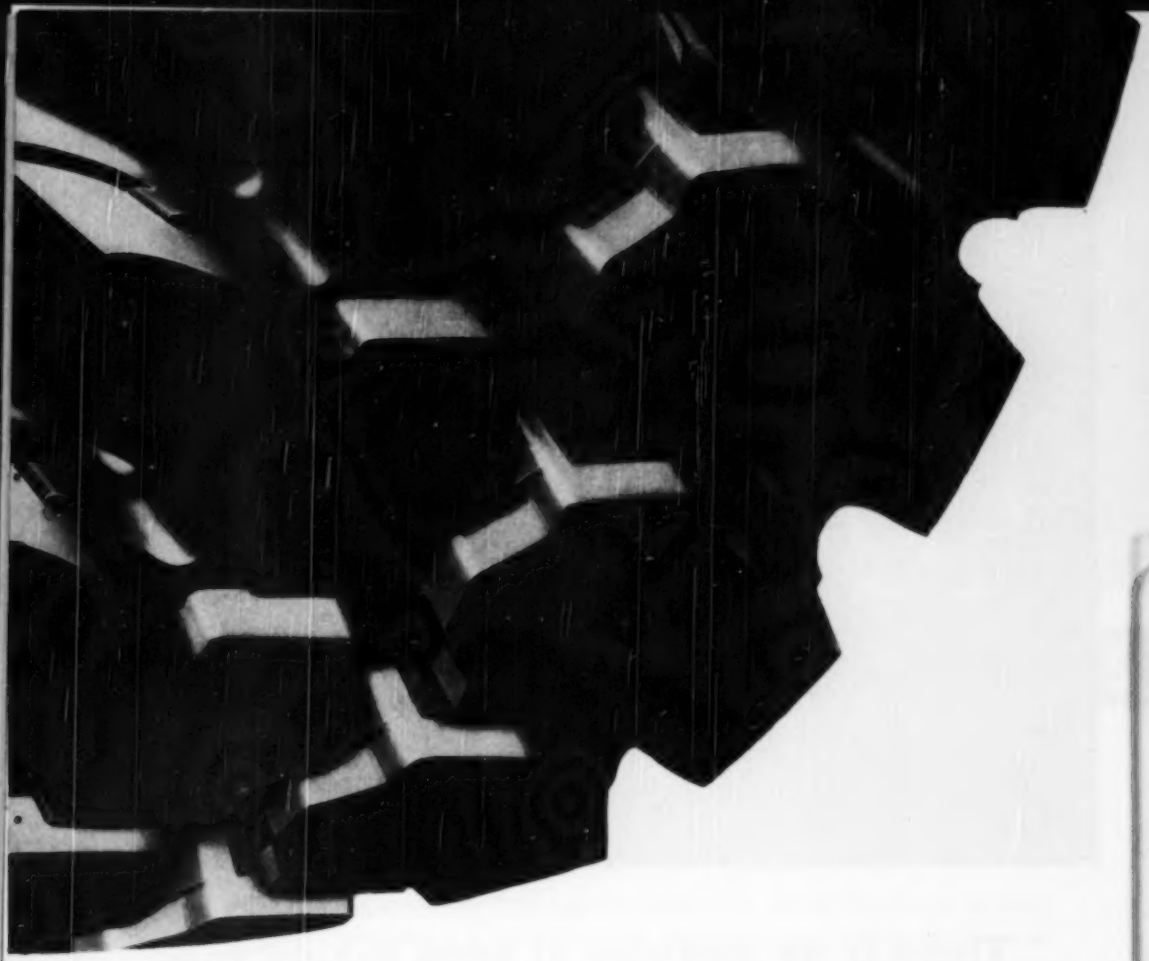
Off-the-Road Traction and Smooth

Truck Tires "Made-to-Order" for America's Specialized Mining Transport

Now comes the great New *Mid-Century* Fleetmaster to meet the trucking demands of mining men everywhere. Truckers who need the spearhead depth of its traction off the road—its smooth, free-rolling qualities on the highway.

This is a true revolution in truck tire design, with job-fitted tread built to eject rock or stone—sidewall compounds to exactly match the rolling requirements of your strip mining operation.

UNITED STATES



Highway Rolling never possible before

On-and-off-the-road
performance
never known before—

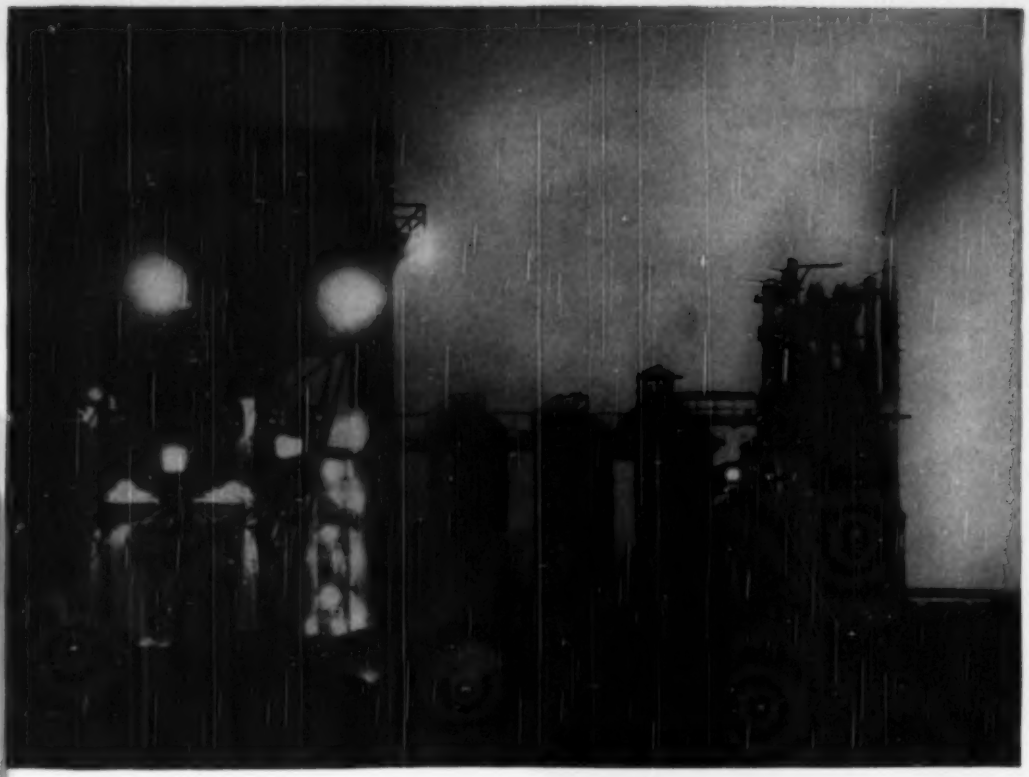
From Mine Pit
to Hard-Surface Concrete

TODAY'S SUPREME TRUCK TIRE WITH HIGHWAY AND OFF-THE-ROAD TRACTION
never possible before!

★ *Job-fitted tread and sidewall compounds*
★ *Free-rolling tread surface*
★ *SPEARHEAD depth traction*
★ NON-SKID ★ CHIP-RESISTANT

A PHONE CALL DOES IT! This is another U. S. Rubber achievement—without rival, imitator or comparison. Phone your nearest U. S. Royal Dealer for Complete Performance Proof and your own JOB-FITTED SPECIFICATIONS.

RUBBER COMPANY *America's Largest Maker of Tires*



There is no shortage of good coking coals on the Baltimore & Ohio

To steel men looking for better coking bituminous, we recommend coals mined on the Baltimore & Ohio. *We know these coals.* They are low in sulphur and ash, and excel in other characteristics needed for efficient coking.

Not only is there an abundant present supply of coking coals on the B & O, but because of developing fields, B & O's *reserves* are increasing. B & O bituminous answers the need of blending for better coke and offers both accessibility and long-range availability. *Ask our man!*

BITUMINOUS COALS FOR EVERY PURPOSE

—from modern mines like this →

BALTIMORE & OHIO RAILROAD

Constantly *doing things* — better!

New JEFFREY 56-RD ROOF DRILL

(Patent Pending)

SPEEDS UP ROOF-BOLTING OPERATIONS

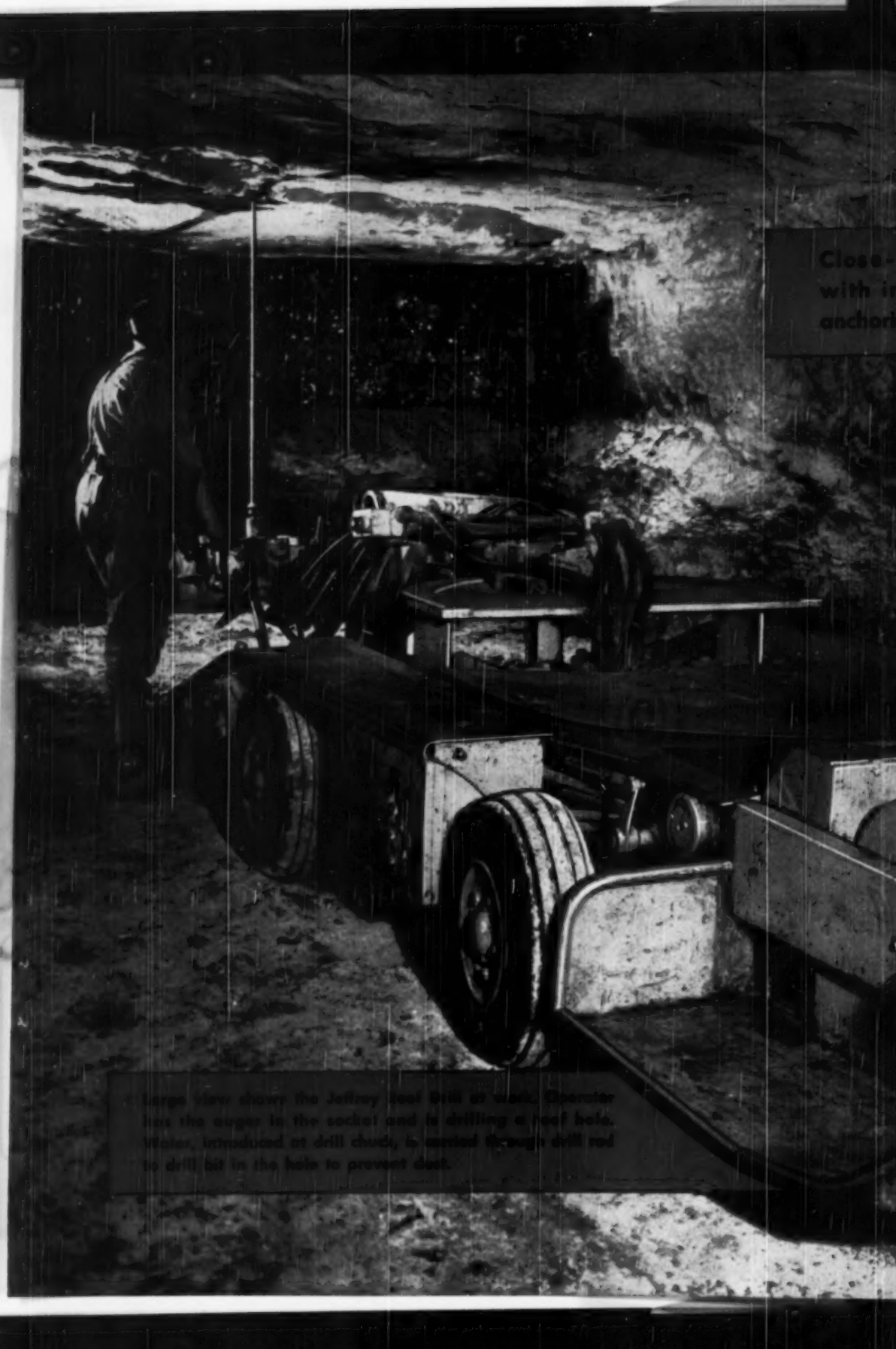
● The New Jeffrey 56-RD Roof Drill features a specially-designed Arm, hydraulically operated and mounted on either a self-propelled track type or rubber tired truck . . . provides a reach of 10′ 10½″ each side of center line of machine.

Straight-line feed for the auger and parallelism to its starting position are maintained by means of cams which shorten and lengthen the Drill Arm and make the necessary angular adjustments as Drill is fed upward.

The drill head includes an impact wrench (see inset on center spread) for anchoring and tightening the bolts.

If you want to cut costs in Roof Drilling, give our engineers a chance to explain the Jeffrey Roof Drill in detail. Write today.

Close-up view of the Arm showing drill chuck and the hydraulic controls for raising, lowering and swinging arm.

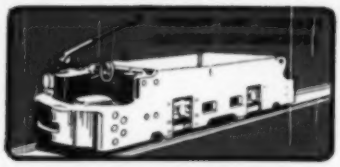


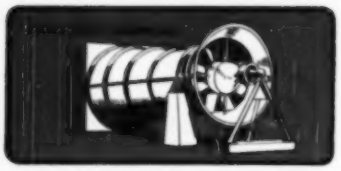
Close-
with i
anchor

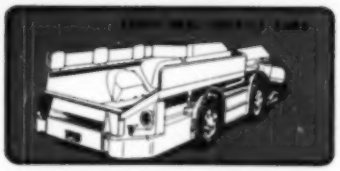
large view shows the Jeffrey Roof Drill at work. Operator has the auger in the socket and is drilling a roof hole. Water, introduced at drill chuck, is carried through drill rod to drill bit in the hole to prevent dust.

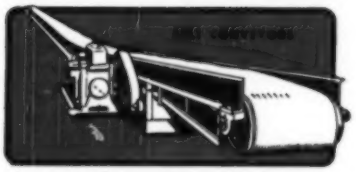
...e-up of the same machine
...n impact wrench in use for
...pring and tightening of bolts.

382-50









JEFFREY

EQUIPMENT FOR COAL MINES

THE JEFFREY MANUFACTURING COMPANY

Established 1877

General and Export Sales Offices

COLUMBUS 16, OHIO, U. S. A.

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38 Newbury Street

BUFFALO 2,
Jackson Building

CHICAGO 1,
Bell Building

CINCINNATI 2,
Carew Tower

CLEVELAND 15,
1560 Hanna Bldg.

DENVER 2,
Ernest & Cranmer Bldg.

DETROIT 13,
5808 St. Jean Avenue

HARLAN, Kentucky

HOUSTON 2, TEXAS
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JEFFREY MFG. CO. LTD., Montreal, Canada
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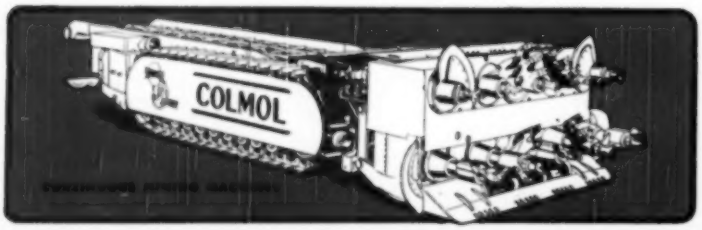
BRITISH JEFFREY-DIAMOND LTD., Wakefield, England
THE GALION IRON WORKS & MFG. CO., Galion, Ohio
THE KILBOURNE & JACOBS MFG. CO., Columbus, Ohio



G.E.'s 9574 all-purpose* insulating varnish provides BETTER BONDING BETTER PENETRATION NO SLUDGING

Mr. Guy W. Probst

That's what Guy W. Probst, owner of the Lockhaven Electric Repair Co., Lockhaven, Pa., says about General Electric's 9574. Here is his statement:

"G-E general-purpose insulating varnish 9574 gives you a cover coat you can see and that fills up between the Formex wires. I've had very good success with it on armatures up to 2000 RPM. On formed coils I can bake before forming and the turns don't come apart when you pull the coil. I've had no trouble with sludging, and all my work is hot dipped. I find that I only use about half as much 1201 Glyptal as a cover coat on 9574 as I had to use over the varnish I had been using, and I get higher gloss and better bonding when 1201 is used over 9574."

EASY TO USE

BAKES AT LOWER TEMPERATURES than is possible with most other synthetic varnishes.

PENETRATES EASILY into the deepest coils.

NO SPECIAL THINNER required (just petroleum spirits).

STABLE—will not tend to harden in the tank.

SEND FOR BULLETIN! If you haven't yet tried G-E 9574, get in touch with your local G-E Distributor, or write for our new bulletin to Section K2, Chemical Department, General Electric Company, Pittsfield, Massachusetts.

G-E 9574 gives excellent results on all types of coils except extra-high-speed armatures. It is one of G.E.'s complete line of electrical insulating materials, including adhesives, wedges, cements, compounds, cords and twines, sleeving, wire enamels, mica, papers and fibers, permafils, tapes, tubing, varnished cloths, varnishes.

You can put your confidence in

GENERAL ELECTRIC

Section K2, Chemical Department
General Electric Company
Pittsfield, Mass.

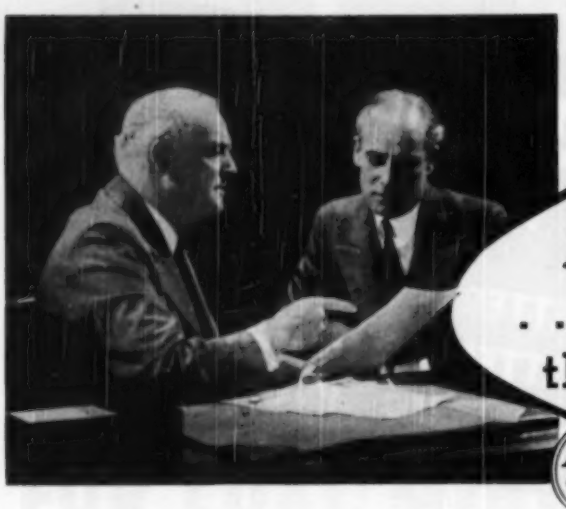
Please send me your free bulletin "The Cost-Saving Insulating Team."

Name _____

Business _____

Address _____

City _____ Zone _____ State _____



Cost and fee basis of operation . . . proved sound through 39 years

A&G CO.

TOP OF THE FIELD

Every customer that we have served to date has approved our plan of compensation, which has been in effect since our origin. Proof of this full acceptance is indicated by the fact that 80% of our business has been repeat.

Our original cost estimate is made on the basis of current market prices for materials. If any, the variance in our original cost estimate has never been more than slight in either direction. When an adjustment is required, by prices rising or falling, you can easily check its validity.

Being strictly engineers and not manufacturers, we have no equipment for sale. Knowing equipment as we do, we recommend the equipment that will best serve you and you pay but the manufacturer's price.

Our fee arrangement can't help but be favorable to you. A choice of one of two plans is presented. One is a flat fee determined at the time of our estimate. The other is one where we go along with you on a small percentage basis, figured on the final cost of the project. If the costs are lower or higher than the original estimate, our percentage fee naturally varies accordingly.

We make every effort to give you all benefits in cost savings and work to give you the most modern in engineering and construction.

When you are ready, let us know and we will contact you.

Scope of Services

- Design and construction of new plants and their various units.
- Organization, operation and management of mines.
- Below ground modernization and mechanization.
- Reconstruction, revamping, or improvement of existing plants.
- General consulting work regarding power, equipment, operation, and various mining problems.
- Valuation for financing, fire loss, taxation purpose—reports and appraisals.

We work with undivided responsibility to you on a cost and fixed fee basis. We are not hampered by any connections which might prejudice the true professional engineering approach to your problems.

ALLEN & GARCIA COMPANY

CONSULTING AND CONSTRUCTING ENGINEERS

332 S. MICHIGAN AVE., CHICAGO 4, ILL. • 120 WALL ST., NEW YORK 5, N. Y.

Big Bruisers

LOOK UNDER THE HIDE

When buying, look under the hide to see what you're getting. Foresight is cheaper than hindsight.

INDIVIDUAL FUEL INJECTION PUMPS for each cylinder – meter the fuel, time the injection, and provide accurate injection pressure. Pumps operate at half engine speed – an important factor in their long life.

NON-CLOGGING, SINGLE-ORIFICE FUEL INJECTION VALVES give clean, efficient combustion throughout the entire operating range of the engine – low idle, part load or full load. They are non-adjustable and interchangeable.

METAL-EDGE TYPE OIL FILTERS consist of four nested parts which provide a large filtering area. The full oil flow passes through these filters continuously, allowing no chance for harmful particles to be circulated by the oil stream.

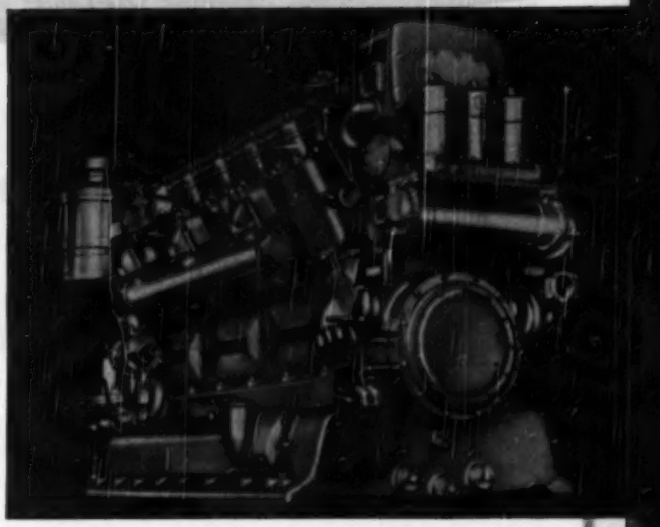
ABSORBENT TYPE FUEL FILTERS consist of a filter paper covered core wound with cotton yarn in a closely controlled pattern so that the entire depth catches and holds even the finest abrasive particles. The low-cost filter elements safeguard the fuel injection parts.

CONVENIENT FUEL PRIMING PUMPS and air bleed valves enable the fuel system to be bled with very little effort. A glass window makes it easy to tell when all air has been removed.

AIR STARTING consists of a vane type air motor which cranks the Diesel through a Bendix type drive engaging the flywheel ring gear. The motor, air pressure regulator, oiler, and control valve may be mounted on either side of the engine.

ELECTRIC STARTING consists of two 32-volt motors mounted on each side of the engine. As in the case of air starting, the Diesel is cranked through a Bendix type drive.

NEED Big Muscles



LOADING, lifting and swinging a full 7-yard load from the end of a 120-foot boom is no "pantie-waist" exhibition. For handling such big bites, the Ruby Construction Company, Inc., repowered their giant Bucyrus-Monighan dragline with the big new 400-horsepower "Caterpillar" D386 Engine. Because of the power and lugging ability of the "Cat" Diesel, bucket size was increased from the original 5-yard capacity. With its more "muscular" "Cat" Diesel, the outfit has moved more earth at a faster rate than it has ever done before.

The D386 and the still more powerful D397 (500 hp.) have extended the line of "Caterpillar" Diesels to meet a much wider range of power requirements. Built in "Caterpillar's" huge new engine factory, "Caterpillar" Diesels offer you many exclusive, profit-making features. By specifying "Cat" Diesels on your equipment orders, you are assured maximum economy, utmost dependability, and lowest maintenance costs.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

SPECIFY "CATERPILLAR" DIESEL POWER IN THE NEW EQUIPMENT YOU BUY—AND FOR REPLACEMENT IN THE EQUIPMENT YOU ALREADY HAVE.

CONSIDER the quick and efficient parts-and-repair service that is available to you (no matter where your headquarters or jobs are located).

USE THE COUPON for specifications and other information on "Cat" Diesels. No obligation.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL

ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO., Box CA-11, Peoria, Ill.

Send specification sheets on "Caterpillar" Diesel Engine models and sizes.

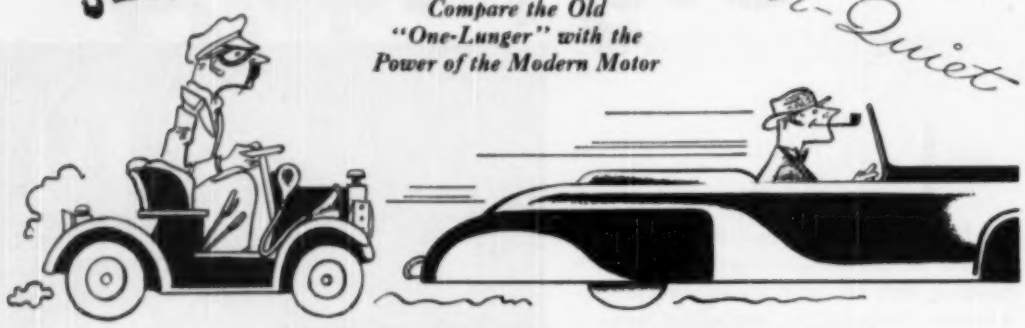
Name _____

Address _____

Yesterday--
JERK ! BANG !

Today--
Smooth-Quiet

Compare the Old "One-Lunger" with the Power of the Modern Motor



...so ROCKMASTER "16" compares with old blasting methods

In the ROCKMASTER "16" Blasting System, pioneered by Atlas, sixteen milli-second delay electric detonators, all starting together, fire at controlled split-second intervals over a period of only a little over a half-second.

Talk to any experienced blaster who has compared ROCKMASTER split-second blasting methods with ordinary instantaneous or delay-action blasting. He'll tell you why it's like comparing a modern multi-cylinder automobile with an old-time one- or two-cylinder model! ROCKMASTER blasting gives a smooth flow of blasting power that means control over throw and breakage never before possible—*with far less noise and vibration!*

Your job may call for two, three, or even all sixteen ROCKMASTER detonators. We help you select them to fit a particular job in quarry, strip pit, mine, construction . . . on the surface or underground. Drill pattern is adjusted to fit the system, often with substantial savings in drilling and dynamite.

Write for your copy of booklet on the ROCKMASTER "16" Blasting System. It includes diagrams for typical loading in quarries, strip pits, mines and many types of construction.

ROCKMASTER "16" TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

ROCKMASTER: Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

Gulf Cam Grease

for better lubrication of shaker screen eccentrics

1. **prevents overheating of straps**
2. **resists leakage and washout**
3. **stable at high operating temperatures**

Specially manufactured for shaker screen eccentrics, Gulf Cam Grease combines all the properties necessary to provide proper lubrication for hard-working cams and bearings.

Gulf Cam Grease is made from a high-grade mixed soap base and a quality lubricating oil of high viscosity. Because it has a high dropping point, Gulf Cam Grease is readily retained in eccentric strap bearings—does not leak out even at the high temperatures encountered in severe service. Thus it is superior to oil for this application—oil has a tendency to leak out from the bearings, leaving them unprotected, and creating an accident hazard.

Just as important is the fact that Gulf Cam Grease is exceptionally stable at these high temperatures—does not separate nor oxidize appreciably. Unlike most high temperature greases, Gulf Cam Grease is an effective lubricant where wet conditions prevail.

Gulf Cam Grease is recommended for the lubrication of all types of cams or eccentrics on the shaker screens of coal breakers and preparation plants. Its use will help prevent overheating in bearings, and insure less wear and lower maintenance costs.

For further information on Gulf Cam Grease, and for expert help on other lubrication problems, call in a Gulf Lubrication Engineer today. Write, wire, or phone your nearest Gulf Office.

Gulf Oil Corporation · Gulf Refining Company

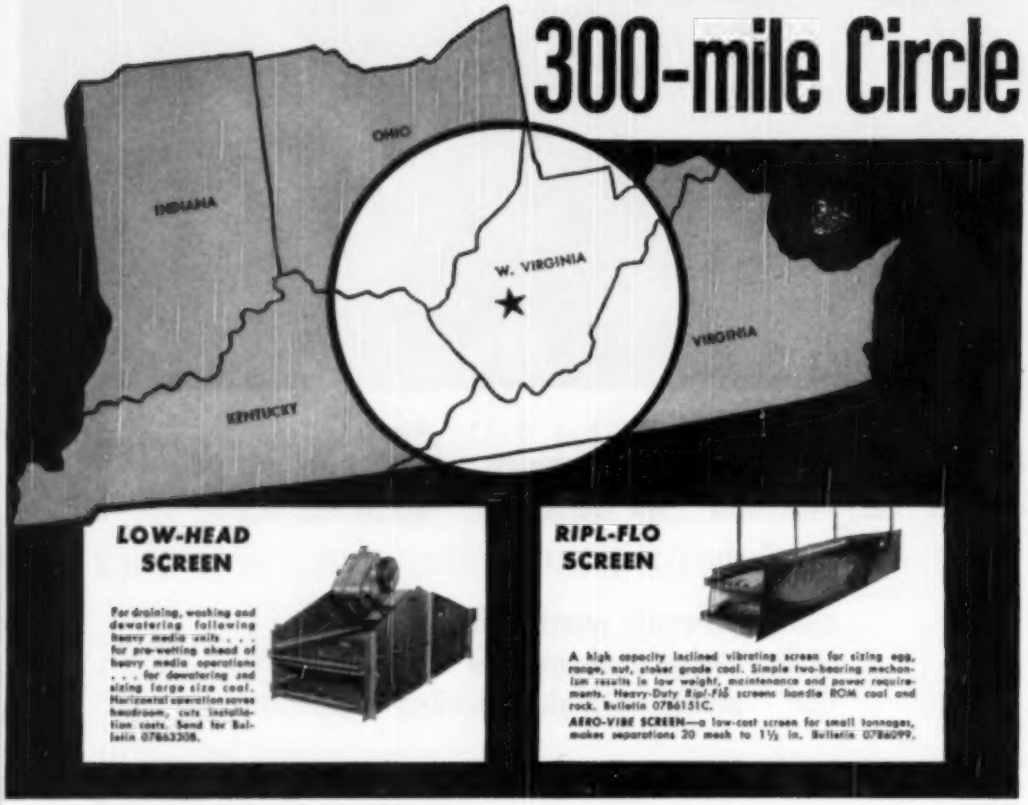
GULF BUILDING, PITTSBURGH, PA.

Sales Offices - Warehouses

Located in principal cities and towns throughout Gulf's marketing territory

GULF INDUSTRIAL LUBRICATION

OVER 1000 ALLIS-CHALMERS VIBRATING SCREENS within this 300-mile Circle



LOW-HEAD SCREEN

For draining, washing and dewatering following heavy media units . . . for pre-wetting ahead of heavy media operations . . . for dewatering and sizing large size coal. Horizontal operation saves headroom, cuts installation costs. Send for Bulletin 07B63308.

RIPL-FLO SCREEN

A high capacity inclined vibrating screen for sizing egg, range, nut, stoker grade coal. Simple two-bearing mechanism results in low weight, maintenance and power requirements. Heavy-Duty Ripl-Flo screens handle ROM coal and rock. Bulletin 07B6151C.

AERO-VIBE SCREEN—a low-cost screen for small tonnages, makes separations 20 mesh to 1½ in. Bulletin 07B6099.

PROOF THAT coal men prefer Allis-Chalmers vibrating screens — more than 1000 are on the job within a 150-mile radius of Charleston, W. Va., most of them in coal preparation plants. And there are thousands more in use elsewhere in the United States and throughout the world.

Coal men have found modern Allis-Chalmers vibrating screens a good bet for keeping tonnages up and costs down. In fact, many Allis-Chalmers screens have paid for themselves several times over in increased coal recovery . . . and reduced operating and maintenance costs.

Sturdy A-C screens are made of high tensile steels, with all-welded construction, "stress-relieved" to eliminate strains around welds. They're built for easy maintenance, too.

The A-C representative in your area can show you how Allis-Chalmers vibrating screens can add profit dollars to your operations. Call him, and write for Bulletin 25B6280A, covering all Allis-Chalmers equipment for coal.

A-3189

ALLIS-CHALMERS, 968A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

Low-Head, Ripl-Flo, Aero-Vibe and Texrope are Allis-Chalmers trademarks.

A-C

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.


Motors

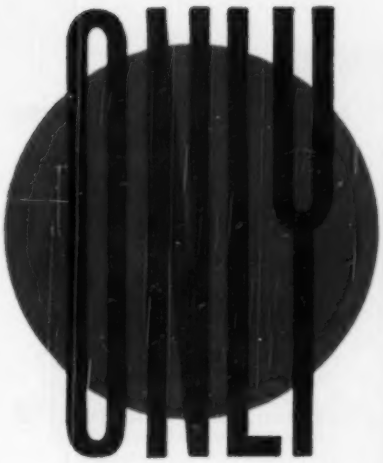

Controls


Texrope Drives


Vibrating Screens


Crushers


Kilns, Coolers, Dryers



TIREX

HAS THE *Selenium* NEOPRENE ARMOR

Only Simplex-TIREX cords and cables are jacketed with the famous Selenium Neoprene Armor. This famous cured-in-lead jacket is well known wherever tough, hard jobs are found. Whether it is coal mining, ship building, open pit mining operations, rock quarrying or foundry work the tough, cured-in-lead jacket provides the kind of staying power that you want. Wherever rough, abrasive conditions are found, there you will find the jobs that TIREX excels at doing.

Actual service records show that Simplex-TIREX cords and cables have proved to be the most economical because the Selenium Neoprene Armor lasts so long.

Whenever your requirements call for the use of a portable cord or cable, specify and be sure that you get Simplex-TIREX Cords and Cables.

If it isn't made by Simplex it isn't Tirex.

TIREX SELENIUM

Simplex - WIRES & CABLES

SIMPLEX WIRE & CABLE CO.
79 SIDNEY STREET,
CAMBRIDGE 39, MASS.

Is poor power supply wasting your money?

Efficient Mining Demands Adequate Power Where You Need It

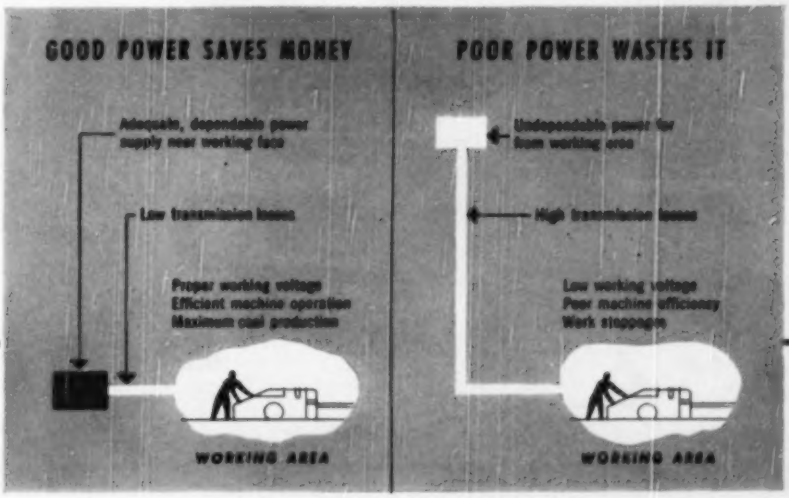
Here's how to avoid the costly consequences of power supply that's inadequate, undependable, or too far from the working face. With Westinghouse *mine-designed* Power Centers and Substations you do away with high transmission losses, low-working voltage, poor machine efficiency, overheated motors, work stoppages, high maintenance costs.

ANSWERS: WESTINGHOUSE MINE POWER CENTER, IGNITRON SUBSTATION

Westinghouse Ignitron Rectifier Substations for d-c mines and Mine Power Centers for a-c operations give you the power you need. Their operation is dependable and automatic. They're available in a wide range of ratings to deliver the volume of power needed. And most important, both are readily portable—compact, lightweight, easy to install and connect—so that power supply can be kept near the working face. This is essential. For example, by moving its power supply one mile closer to the working face, one new mine boosted production 23%—*with no increase in men or equipment.*

CHECK YOUR OPERATION; LET WESTINGHOUSE HELP

Make sure you're not wasting money that a good power supply would save. Study your operation. Westinghouse Mine Specialists will be glad to help—with no obligation, of course. Just call your nearby Westinghouse office. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94847



Bethlehem Steel Company
(INCORPORATED)

Bethlehem, Pa.

AN OPEN LETTER TO WIRE-ROPE USERS:

The many advantages of Form-Set preformed wire rope are now available at such slight extra cost that we can recommend it for practically all hoisting and operating duties. We say this with full confidence that extra value will be obtained by the purchase of this rope.

When you order operating wire rope, the addition of the word "Form-Set" to your specifications is, we believe, the best means of insuring finest overall performance and general satisfaction.

The following well-known advantages of Form-Set preformed ropes over the non-preformed types have often resulted in economies that justified even the old higher extra cost:

* Because the rope is relaxed by preforming, single wires do not break as quickly from wear and bending fatigue. Being relaxed, they can wear thinner, hence longer, before breaking.

* Wickering of broken wires is much reduced. This makes the rope safer to handle; reduces the possibility of damage to neighboring wires.

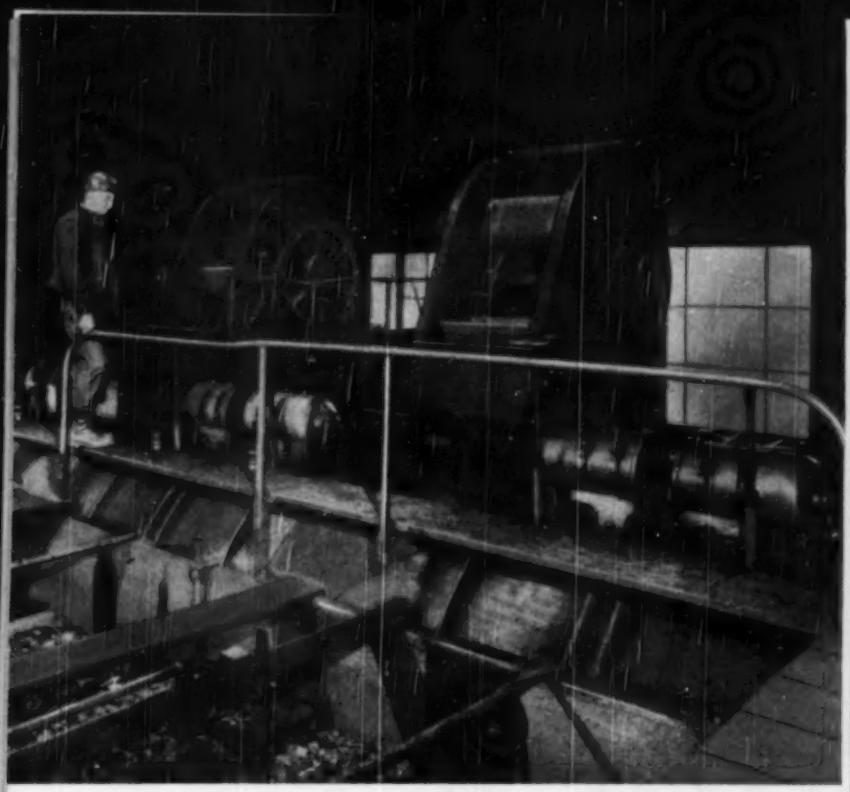
* Form-Set rope is easier to install properly. Handles better ... seizing not needed. Has extra resistance to kinking, crushing, distortion. Spooling is tighter, more uniform.

At the risk of repeating, we'd like to close with this thought: Form-Set preformed rope is now within everybody's reach. It costs so little extra, you simply can't afford to pass it up.

Sincerely,

BETHLEHEM STEEL COMPANY

P. S. - On the Pacific Coast our wire rope is sold by Bethlehem Pacific Coast Steel Corporation; oil-country rope by Bethlehem Supply Company of California. Export Distributor: Bethlehem Steel Export Corporation.



Coal washer gets clean bill of health with . . .

AT A LARGE midwest mine, operators tried a conventional grease on the air valves of a coal washer. These valves control air flow used to agitate and separate coal from refuse. The grease did not seal the control valves against air leakage. Resulting loss of pressure threw air pulsations off beat, caused uneven operation and poor separation of refuse from the coal. Grease consumption ran high.

The washer was switched to a SUPERLA Grease recommended by a Standard Oil lubrication specialist. *This lubricant took the job in stride.* It prevented air leakage, kept bearing surfaces well lubricated. Throughout nine years of service it has kept valves in top working order and in excellent condition. Efficient separation of refuse from the coal has been the result.

A lot of tough lubricating jobs in your mine can be turned over to SUPERLA Greases. They will give you results comparable to what you can get with the highest type of special greases. They will prove as readily available and economical as ordinary cup greases.

SUPERLA
REG. U.S. PAT. OFF.
Greases

Discuss the advantages of SUPERLA Grease with a Standard Oil lubrication specialist. His headquarters are near your mine. How you can benefit from his services is explained at the right. Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

What's YOUR problem?

J. A. Grieve, lubrication specialist at Standard Oil's Decatur office, helped this midwest mine make important savings with SUPERLA Grease. He was close at hand, gave operators engineering service when they needed it.

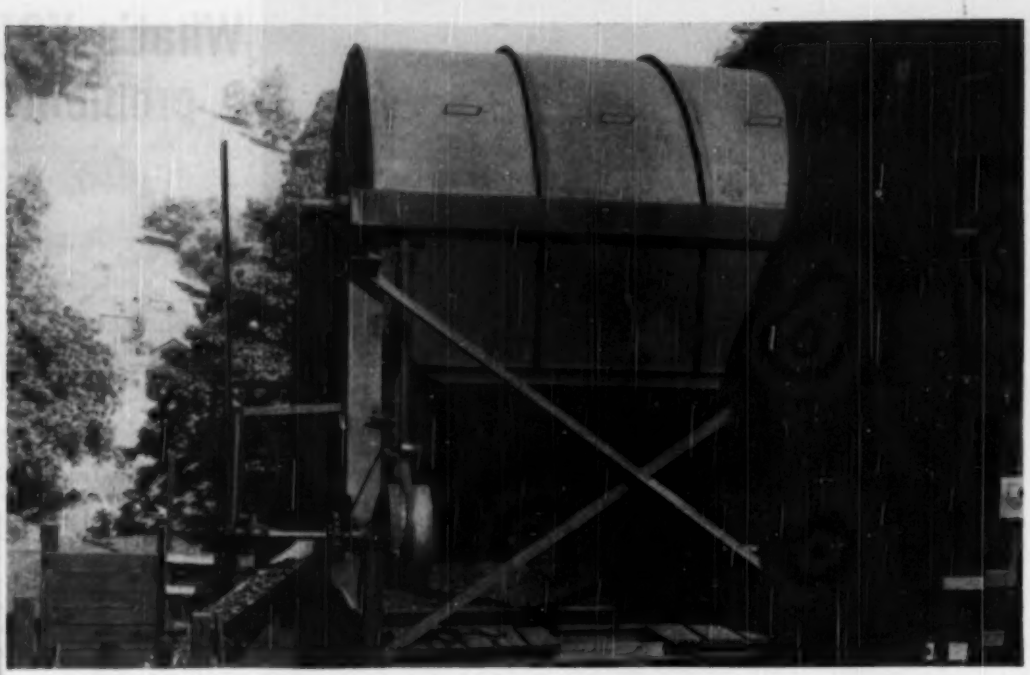
There's a corps of Standard Oil lubrication specialists throughout the Midwest. You'll find one located near your mine. Through special training and a lot of practical experience, this man has gained a working knowledge of lubrication that can mean real savings for you. To obtain his services, simply contact the nearest Standard Oil (Indiana) office. Discuss with him the savings you can make with such outstanding products as:

STANOIL Industrial Oils—Here's *one* line of oils that provides cleaner operation of loader and crane hydraulic units; supplies effective lubrication in compressors, gear cases, and circulating systems. One or two grades can replace a wide variety of special oils and lubricants.

SUPERLA Mine Lubricants—These new, improved oils and greases provide better lubrication of cutters, loaders, locomotives, mine cars, and other underground equipment. They eliminate transmission-case deposits, reduce clutch-plate gumming, and minimize wear on gears and bearings.

CALUMET Viscous Lubricants—On open gears and wire rope, these greases strongly resist washing and throw-off. Their superior wetting ability affords better coating of gears and better internal lubrication of wire rope.

STANDARD OIL COMPANY (INDIANA) STANDARD



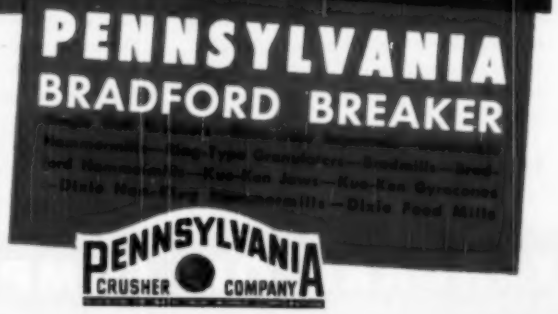
INSTALLED IN 1906

STILL GOING STRONG

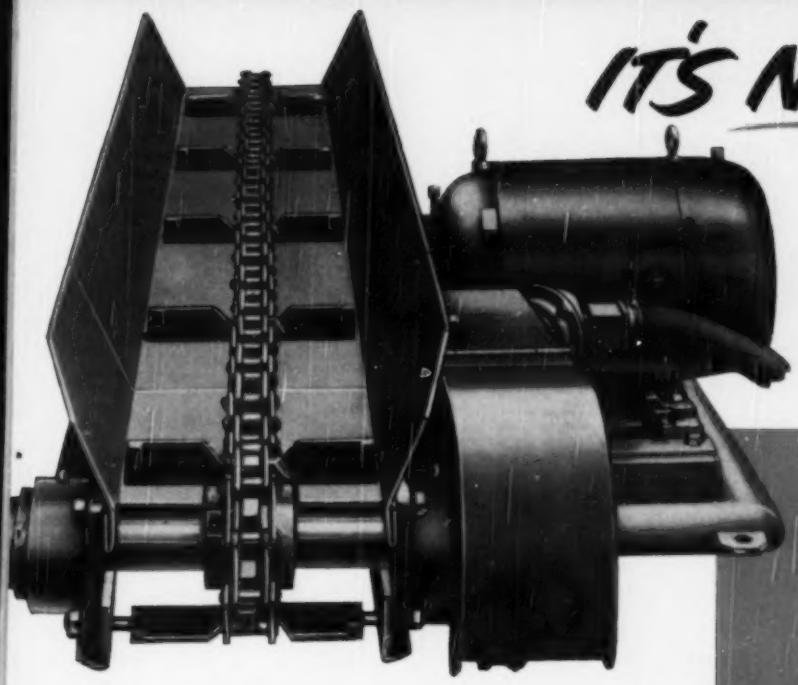
The Pennsylvania Bradford Breaker illustrated above started to condition coal at a Pennsylvania coal mine in the spring of 1906 and with the exception of temporary shutdowns it has been in continuous operation. This is not an unusual case. In fact, it is the usual kind of service operators get from Pennsylvania Bradford Breakers. However, durability and dependability are only two of the features that make these machines outstanding. For instance, there is the

Big Feed Opening

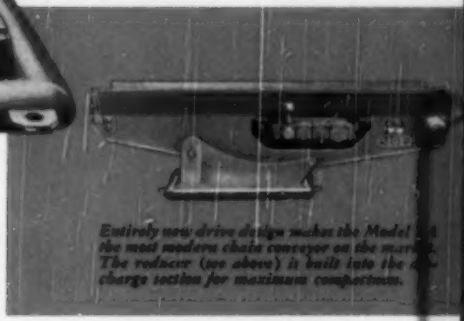
with no obstructions at the feed or discharge ends. Crushing is by gravity impact with continuous screening. Tramp iron, timbers, and other refuse move freely into the breaker and out the refuse chute. And when those large rocks come up with the coal, they are no problem at all. Capacities to 1500 TPH. Low power demand. Write for Bulletin 3007.



Pennsylvania Crusher Company, Division of Bath Iron Works Corporation, 1711 Liberty Trust Building, Philadelphia 7, Penna. Representatives in New York, Boston, Pittsburgh, Birmingham, Roanoke, Detroit, Chicago, St. Louis, Crosby, Minn., Los Angeles, London, England.



IT'S NEW! and a LEADER



Entirely new drive design makes the Model FA the most modern chain conveyor on the market. The reducer (see above) is built into the head-end discharge section for maximum compactness.

JOY 1951 MODEL FA CHAIN CONVEYOR

THE SIMPLEST, LIGHTEST, MOST COMPACT and EFFICIENT DESIGN IN THE FIELD . . . 12", 15" and 20" SIZES

Exclusive Features!

- ★ V-Belt drive, unaffected by misalignment, eliminates flexible coupling.
- ★ Helical and spur reducer—20% more efficient than worm reducers.
- ★ Ball-bearing mounted shear-pin sprocket—eliminates wear after shear.

LONGER SERVICE with LESS MAINTENANCE

Advantages You'll Like!

- ★ Compared to conventional drives, the new Model FA is 500 lbs. lighter and requires 4 sq. ft. less area.
- ★ Has non-jamming gravity take-up and drop-forged steel flights—flight integral with the link.
- ★ Available with open or closed-end tail sections. Three chains available: 19,000 to 27,000 lbs. ultimate strength.

Consult a Joy Engineer

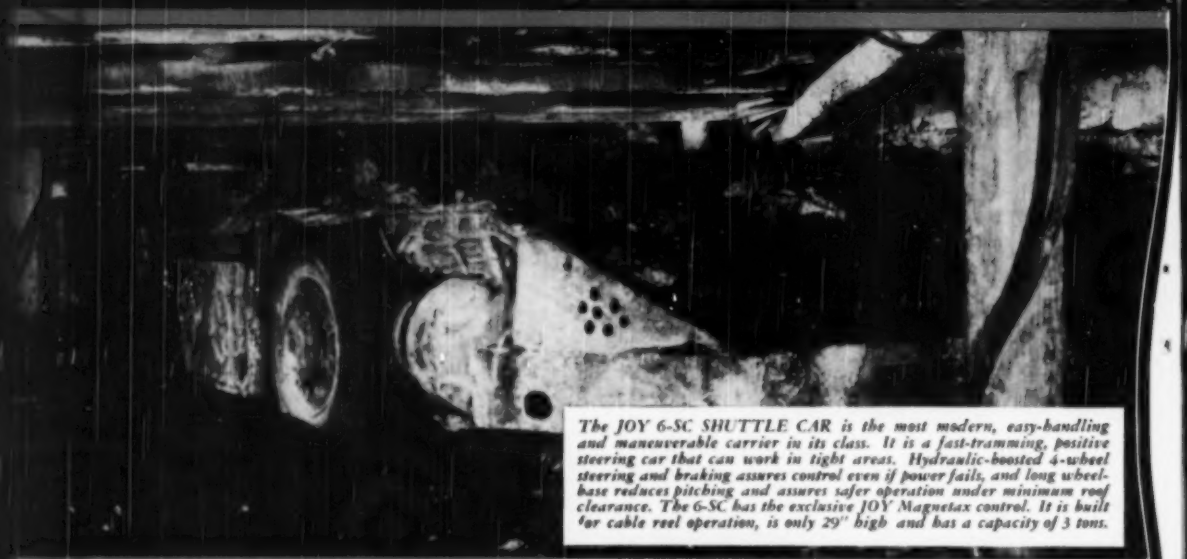
W&D CL 3347

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

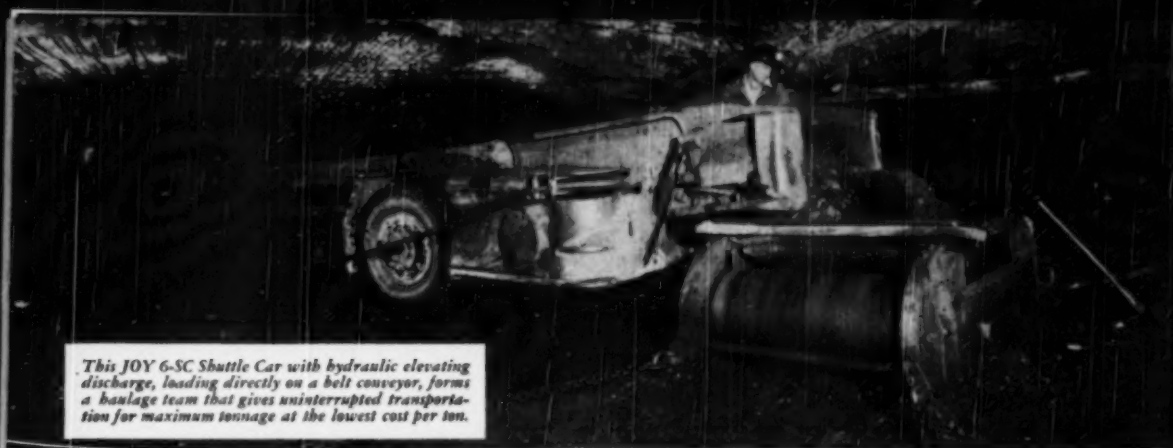
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

The JOY 14-BU LOADER will out-perform and outlast any comparable loader. It is simpler and more compact, with fewer gears, shafts and other moving parts to require maintenance. It has a longer tread-to-length ratio, trams with less pitching and requires less roof clearance on rolling bottom, and is more maneuverable and safer under all conditions. JOY's exclusive Magnetax control permits easy, positive one-man operation and is trouble-free.



The JOY 6-SC SHUTTLE CAR is the most modern, easy-handling and maneuverable carrier in its class. It is a fast-tramming, positive steering car that can work in tight areas. Hydraulic-boosted 4-wheel steering and braking assures control even if power fails, and long wheelbase reduces pitching and assures safer operation under minimum roof clearance. The 6-SC has the exclusive JOY Magnetax control. It is built for cable reel operation, is only 29" high and has a capacity of 3 tons.

The famous JOY loading action, field-proved by more than a quarter-century of experience, is one of the chief reasons why over 75% of all mechanical coal loaders in use today are JOY-built. The powerful digging action of the 14-BU's gathering arms can even take coal from a solid face, and will handle fines or any size lumps, yet hold degradation to a minimum. The 14-BU is built in heights as low as 30½", and will load up to 8 tons per minute.



This JOY 6-SC Shuttle Car with hydraulic elevating discharge, loading directly on a belt conveyor, forms a haulage team that gives uninterrupted transportation for maximum tonnage at the lowest cost per ton.

IN LOW COAL

JOY

LOADERS and SHUTTLE CARS

Move More tonnage out - Faster - at Less cost per ton!

★ Be sure to see the JOY Film in natural color, with sound—

"TRACKLESS MINING IN COAL"

Available for free showings—write the JOY Film Booking Department.

Write for Bulletins, or

Consult a Joy Engineer

WBD-CL 5041

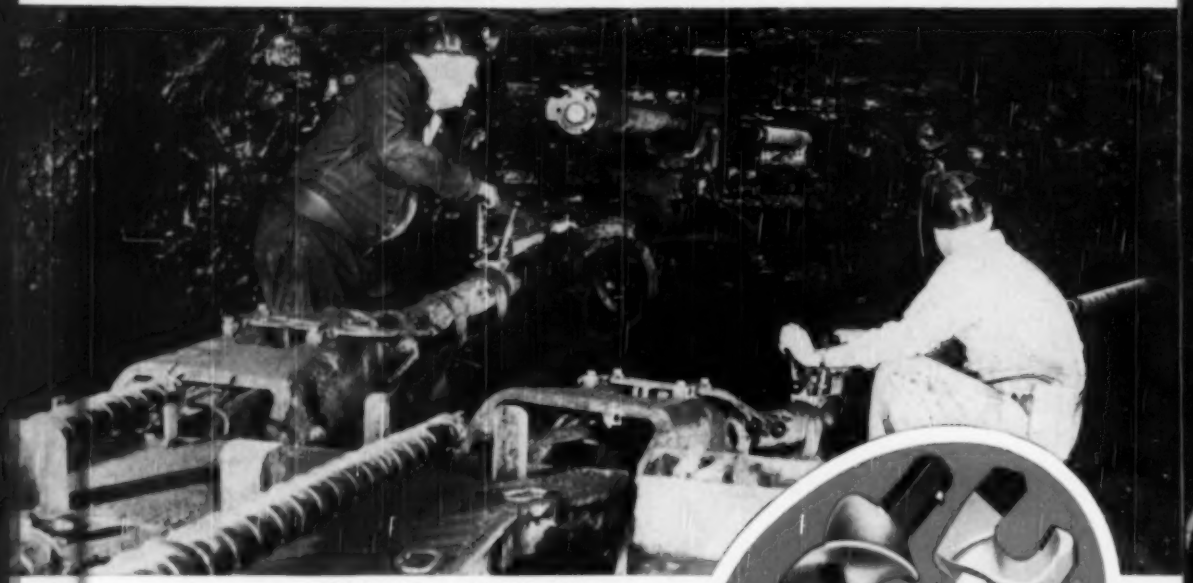
JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

JOY SULMET CARBIDE AUGER BITS

Save PLENTY in this mine!



JOY CD-26 Coal Drill, for trackless operations.

Sulmet Auger Bits are available in 1¼" to 3" dia. sizes... Finger bits for larger size holes as required.

PLACE AND CONDITIONS: A mine in Southern Illinois. About 2' of sulphurous coal at the bottom of the seam—extremely hard to drill or cut. A bad top requires them to move in and out of a panel fast.

FORMER METHOD: Since their drill could only put in 16 holes in the bony per shift, they had to bottom cut and then drill the softer, upper part of the seam.

PRESENT METHOD: With Sulmet Auger Bits, they can put in 260 holes per shift in the bony with the same drill. Therefore, they can now cut above the hard band and shoot the bottom up.

RESULTS:

FORMER METHOD	PRESENT METHOD
Cutter chain life.....25,000 tons	*Cutter chain life.....75,000 tons*
Cutter bit cost.....$.08 to $.10/ton	*Cutter bit cost.....$.015 to $.02/ton*

This improvement is entirely due to the fact that Sulmet Bits permit high speed drilling in impurities without excessive auger bit cost.

Consult a Joy Engineer

W & D CL 3246

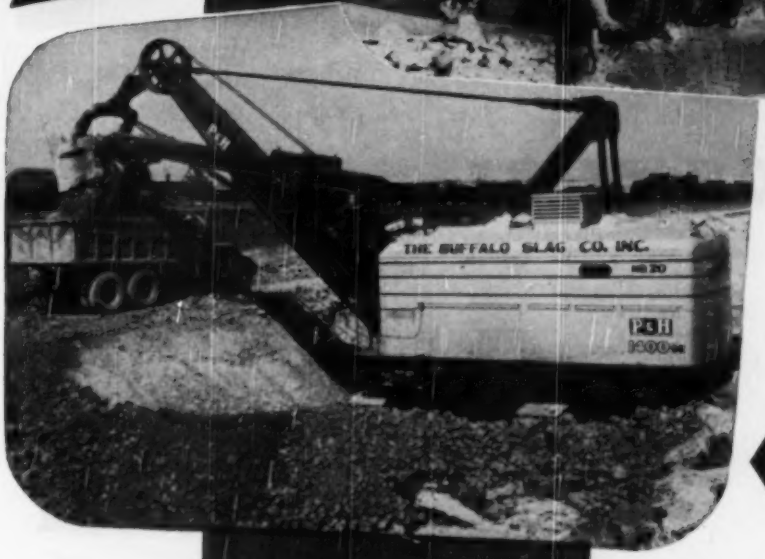
JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

For Rock Bottom Costs From Start to Finish!

START . . . FLUXING STONE
A P&H Model 1400 Diesel-Electric (4 yd.) shovel, owned by Drummond Dolomite Inc. at Drummond Island, Michigan.



FINISH . . . BLAST FURNACE SLAG
A P&H Model 1400 Diesel-Electric shovel owned by the Buffalo Slag Co., Buffalo, New York.

P&H DIESEL-ELECTRIC SHOVELS

with *MAGNETORQUE** HOIST DRIVE

Now, you can have electric shovel efficiency *anywhere* with a P&H Diesel-Electric quarry and mining shovel. It's a complete electric shovel . . . with the addition of a diesel engine to furnish power . . . entirely independent of high line service.

Years of the toughest rock digging have proved the P&H Diesel-Electric from every standpoint . . . dependable operation . . . less maintenance . . . rock bottom tonnage costs.

This simplified P&H Diesel-Electric shovel is made possible by the exclusive P&H Magnetorque Hoist Drive. Hoist generator, hoist motor, slip friction clutch and other mechanical devices are completely eliminated. Magnetorque is only one of many P&H Added Values. Ask for Bulletin X83-DE.

Every Third P&H Electric Shovel Sold is a Repeat Order.

P&H ELECTRIC SHOVELS
4540 West National Avenue
Milwaukee 14, Wis.

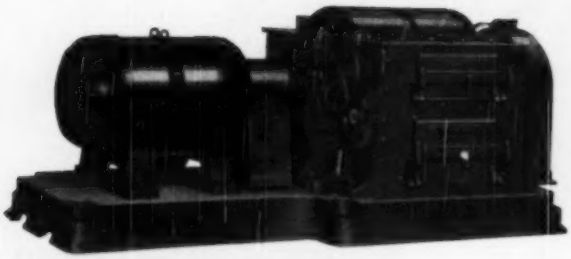
HARNISCHFEGER CORPORATION

*Trade-Mark of Harnischfeger Corporation for electro-magnetic type clutch

FOR LESS THAN

AMERICANS WILL CRUSH

1 TON OF COAL



Based on Case Histories Involving 61,000,000 Tons of Coal

Costs include . . . Depreciation, Maintenance, Replacement parts, Interest on Investment, and Power

There can be no better proof of the Built-in Quality of AMERICAN CRUSHERS

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 MACKLIND AVE.
ST. LOUIS 10, MO.

LOWER COST-PER-MILE

That's why coal haulers buy Goodyear tires. That's why more tons are hauled on Goodyear tires than on any other kind!

HARD ROCK LUG

For tire-bruising, off-the-road work, this super-rugged tire is tops. Its tough armored carcass and extra-husky lugs assure longer wear, better performance no matter how tough the going is.

ROAD LUG

For trucks that operate both OFF and ON the road, this dual-purpose tire is best. Tough construction and special tread design provide super-traction off the road—long, smooth mileage on the road.

GOODYEAR

We think you'll like "THE GREATEST STORY EVER TOLD" — Every Sunday — ABC Network

Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

FOR LOWER DRILLING COST PER TON

for roof bolting

Improved Carboloy Roof Bolting Drill—

Fast, easy drilling in hard slate, shale and laminated limestone. Extra dividends in reduced equipment costs and handling time. Carboloy's Roof Bolting Drill offers you this, and more, too.

This improved drill is tipped with Carboloy Cemented Carbide, *the hardest metal made by man.* It assures maximum speed in medium roof drilling, and develops faster drilling speed than pneumatic methods. Check these points: improved flute design, removes cuttings faster; alloy steel body, for greater strength; plus a carbide tip that will drill *more* holes.

Carboloy's Improved Auger Drill Bit

— for faster, easier drilling

Unbeatable—you'll slash coal drilling costs right and left with this improved auger drill bit. Ideal for post, mounted and push drills. Look at this:

- Maximum clearance and relief angles permit freer, faster cutting.
- Improved spiral prevents packing of coal cuttings.
- Uniform high-quality carbide throughout entire tip. Assures longer bit life.
- Long tips of Carboloy Cemented Carbide permit many more regrinds.

PLUS • Forged alloy steel shank

Carboloy's Improved "Finger Bit"

— for strip, underground mining

Ideal for use in hard-to-take-hold-of medium ground! Provides real gouging action. Fits all standard auger drill heads using ½" bits. Check these plus values:

- Faster cutting due to larger clearance angle on shank.
- Drills more freely.
- Less pressure required.
- Uniform high quality throughout entire tip. Assures longer drill life.

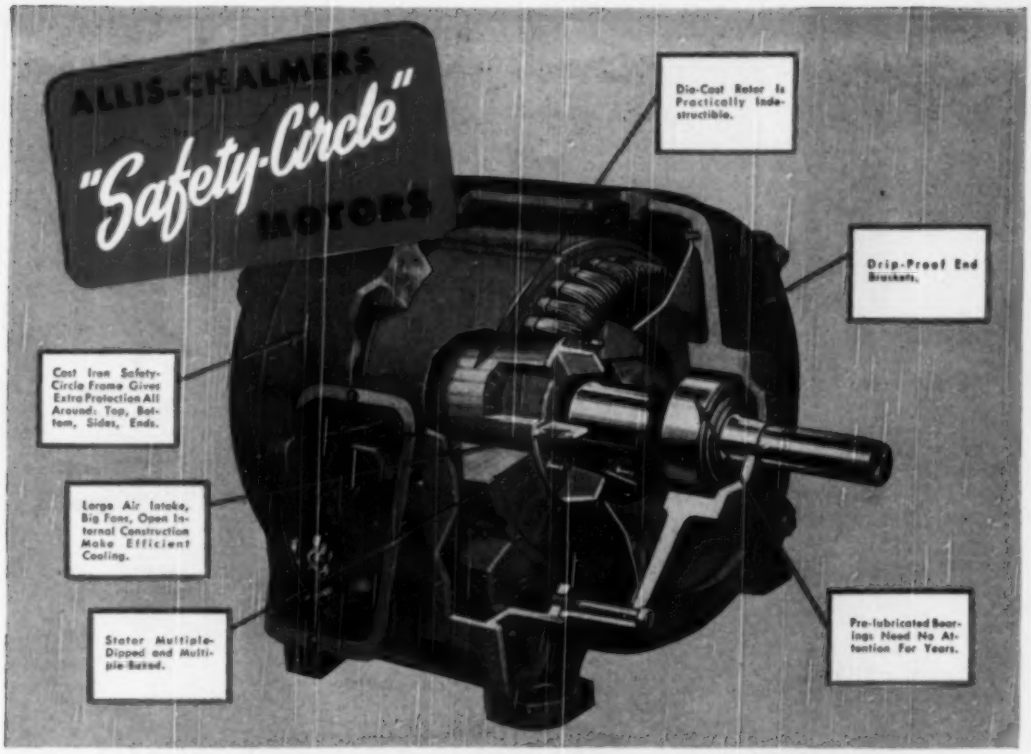
PLUS • Alloy steel shank—heat-treated.

Carboloy's Mining Machine Bit— *with 8 important advantages*

Not only do you get top carbide quality, top performance and top efficiency, but you get these 8 big plus advantages with this Carboloy mining machine bit:

- Shank level with insert, for free flow of coal.
- Less shank steel to grind, yet adequate insert support.
- Less carbide to grind; faster grinding, greater tip economy.
- Smaller point affords less power consumption.
- Forged alloy steel shank resists bending, permits set screw clamping.
- No shoulders; set to any gauge size within range of uses.
- Maximum hold through combination of braze and mechanical holding.
- Approximately 50% greater thickness of insert at cutting edge.

CARBOLOY®
CEMENTED CARBIDE
FOR GREATER MINING ECONOMY



HOW SAFETY-CIRCLE

Means Motor Dependability

EXTRA PROTECTION means extra dependability. That's why Allis-Chalmers protects the working parts of the motor with the exclusive *SAFETY-CIRCLE*. Compare this motor with motors of less rigid construction. The *SAFETY-CIRCLE* motor will not distort in mounting or under strain. And you get the extra protection of drip-proof end brackets at no premium.

EXTRA PROTECTION INSIDE, TOO

Stator is multiple-dipped and multiple-baked in special insulating varnish. Rotor is die-cast aluminum. Stator is mounted in four longitudinal ribs which leaves plenty of air space between stator and frame. Large fans cast integrally with the rotor and ample air intakes keep temperatures well within rated limits. *Ball bearings are factory-lubricated and require no further attention for years.*

When you shop for motors, remember *SAFETY-CIRCLE* gives you *extra protection, extra dependability* and *lower operating costs.*

For details on *SAFETY-CIRCLE* advantages, see your A-C Authorized Dealer or Sales Office or write for Bulletin 51B6210B. Sizes 1 to 20 hp, 326 frames and smaller. *Safety-Circle, Texrope* and *Vari-Pitch* are Allis-Chalmers trademarks. A-3146

ALLIS-CHALMERS, 968A SO. 70 ST.
MILWAUKEE, WIS.

ALLIS-CHALMERS

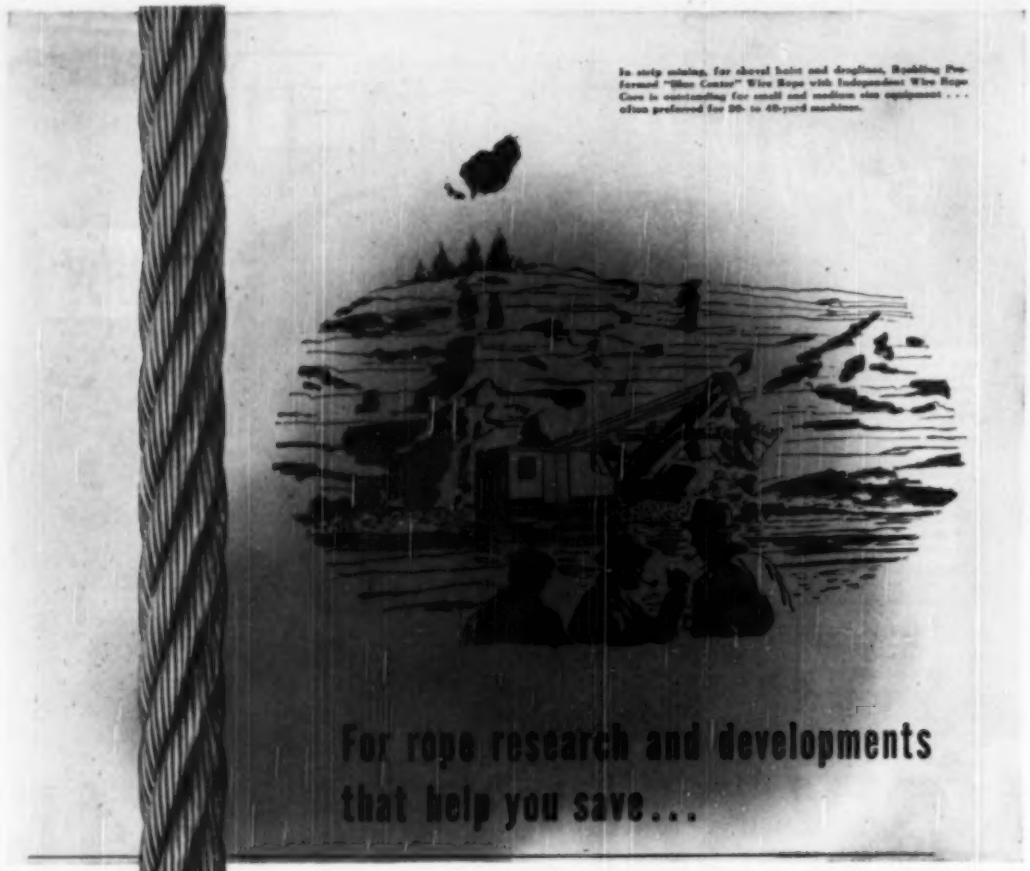
Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.

PUMPS — Integral motor and coupled types from ½ in. to 72 in. discharge and up.



Today it's Roebling!

YEAR BY YEAR, industry makes new and more stringent demands upon wire rope . . . and Roebling leads in developing types that meet these demands with utmost efficiency and economy.

Take Roebling Preformed "Blue Center" Wire Rope with Independent Wire Rope Core!

No finer rope has ever been made, and its basis is "Blue Center" steel—an exclusive Roebling development. Its high resistance to abrasion, shock and fatigue spells long life . . . To this, Roebling *Preforming* brings the further advantages of new handling ease and improved performance . . . And the addition of I.W.R.C. assures top resistance to operating pressures and provides increased rope strength.

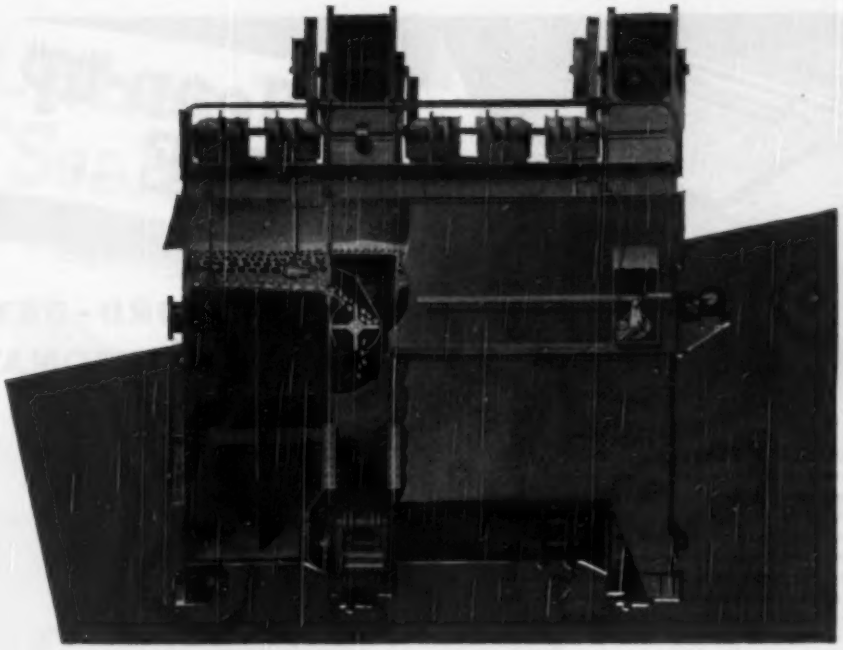
Roebling makes a wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man recommend the best rope for low-cost performance on each of your installations.

ROEBLING

A CENTURY OF CONFIDENCE

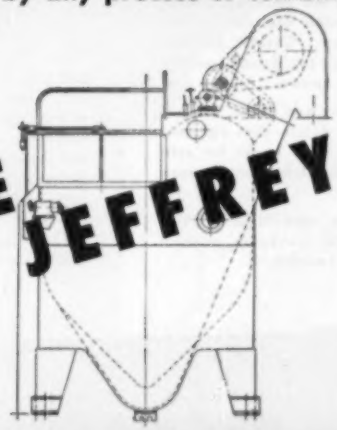
Atlanta, 934 Avon Ave. • *Boston*, 51 Sleeper St. • *Chicago*, 5525 W. Roosevelt Road • *Cincinnati*, 3253 Fredonia Ave. • *Cleveland*, 701 St. Clair Ave., N. E. • *Denver*, 4801 Jackson St. • *Houston*, 6216 Navigation Blvd. • *Los Angeles*, 216 S. Alameda St. • *New York*, 19 Rector St. • *Philadelphia*, 12 S. Twelfth St. • *Portland*, 1032 N. W. 14th Ave. • *San Francisco*, 1740 Seventeenth St. • *Seattle*, 900 First Avenue S.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON 2, NEW JERSEY



JEFFREY 84" Two Compartment, 5-cell Jig—105 sq. ft. of screen area.

WASH 8" x 0" Coal in one Jig. . . Results unsurpassed by any process or combination of processes.



THE JEFFREY JIG

(Patented)

THE JEFFREY MANUFACTURING CO.

Established in 1877

912 North Fourth Street, Columbus 16, Ohio

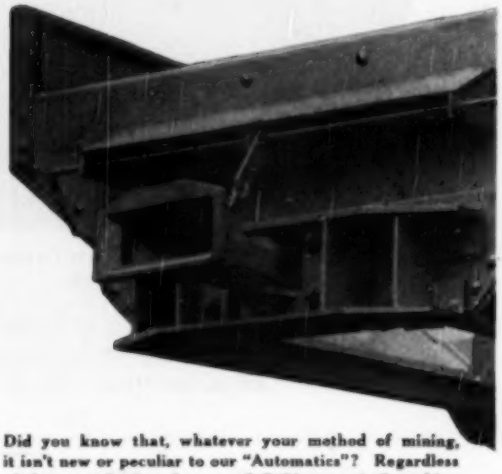
No Clean-up HERE...

THE SANFORD-DAY *Completely Sealed* "AUTOMATIC"

The "COMPLETELY SEALED" feature now being built into every S-D "Automatic" drop bottom car is money saving news to mine operators who have been looking forward to the day of dust-free tracks. Coal dust accumulation is expensive. Some mines have been spending over $10,000 annually on track clean-up alone. What is it costing you? The S-D "Sealed Automatic" completely eliminates this expense because it is dust sealed both at wheel hoods and at the necessary clearance space between the doors and the frame. The coal dust can't dribble out and accumulate on the track . . . it stays in the car until it is dumped in the bin with the coal. This patented Sanford-Day feature is another step in maintaining Sanford-Day leadership in saving money for mine operators. You still get the same big capacity and automatic unloading. You get our improved long-life construction and our foolproof "Jerk-Out" unlatching device, that operates beneath the car. Now, with this revolutionary "COMPLETELY SEALED" construction . . . you get the greatest money saving car the industry has ever known.

The S-D "Automatic", shown above and below, has our foolproof "Jerk-Out" unlatching device that operates underneath the car. It has two latch hooks for safe and foolproof operation, and all unlatching mechanism on end of car is eliminated.

No other car can offer you the advantages of S-D "Automatics" for efficient service, maximum production and low cost per ton of coal handled.



Did you know that, whatever your method of mining, it isn't new or peculiar to our "Automatics"? Regardless of the type of mine, there are S-D "Automatics" working under the same conditions elsewhere, and our company can show you these installations. So, if you have a special problem . . . if you're looking for greater efficiency, write today, we'll be glad to furnish complete details on the S-D "Completely Sealed Automatic," and how they are used in mines similar to yours. Seeing is believing, just contact us.

You can keep your diesel-powered or gasoline equipment going longer between overhauls in severe duty service by using ONE oil — Sinclair SUPER TENOL. In fact, operators report that under tough operating conditions — high temperature, high speed, over-load... or low temperature, light load, long idle, stop-and-go — they have *more than doubled the life of their equipment* between overhauls with versatile SUPER TENOL.

Consider how you can cut downtime and grease inventories by using ONE single grease for the complete lubrication job. Sinclair Litholine provides better lubrication than long-established specialized greases. And that means for *all* lubrication points — chassis, wheel bearings, water pumps, universal joints — in winter or summer, under all kinds of operating conditions. Litholine gives you —

1. Superior protective lubrication at *every* point.
2. No danger of costly misapplication.
3. Quicker servicing, less downtime.
4. Smaller grease inventories. One grease instead of from three to four.
5. Fewer dispensing units.
6. Less chance for contamination.
7. Simplified purchasing and distribution.
8. Less wastage.

Sinclair will gladly send you a folder describing demonstrations showing the superiority of Litholine over other greases.

SUPER TENOL AND LITHOLINE

"Down Time" is costly time

• **Resilient Neoprene webbing cushions impact, retains flexibility, reduces "shorts."**

• THE ROME 60 LINE INCLUDES:

- **Type SO portable cords**
- **Single conductor locomotive cables**
- **Concentric mining machine cables**
- **Twin (parallel duplex) mining machine cables —types W and G**
- **Multiple conductor portable power cables types W and G**

Look *for Appro. No. P-105 BM Molded in the Neoprene sheath—your assurance of compliance with Federal and Pennsylvania Safety Codes.*

. . . Rome 60 Mining Cables

WON'T LET YOU DOWN!

With a mobile unit that produces 400 tons per shift, it's easy to see that "down time" on even the smallest piece of equipment can cause costly tonnage losses. On top of that, over $60,000 worth of equipment stands idle until repairs are made. With costs rising every day, it is more important than ever to protect yourself against such losses by insisting on Rome 60 Mining Cables.

Rome 60 Mining Cables are specifically designed to withstand hard usage. For example, in the shuttle car cable opposite, a tough Neoprene web between ground and power conductors gives the *extra* protection that means long, trouble-free service. Shorts are minimized, maximum flexibility and greater impact resistance, assured.

A tough Neoprene sheath, molded in lead, makes Rome 60 highly resistant to moisture, oil, abrasion, flame, and acid. Heat resistant insulation permits continuous operation at 75° C. . . . affords higher current carrying capacities and overload protection.

These are but a few reasons why so many mine operators have found that Rome 60 minimizes "down time." Send for the free bound book, "The Story of Rome Cable" and see how modern facilities backed by sound engineering makes Rome 60 your best buy.

ROME 60 REMOTE CONTROL AND DRILL CABLE

Neoprene Sheathed Molded in Lead

Designed for rugged service, this cable is specifically recommended for the powering of drills, as well as for portable power circuits in the remote control of other equipment.

While maximum flexibility is retained, the cable sheath thickness is increased to comply with Bureau of Mines standards. This heavier, two layer, reinforced Neoprene sheath eliminates the need for hose protection and provides high resistance to mechanical abuse.

Manufactured in full conformity to State of Pennsylvania and Bureau of Mines Safety Codes, Rome 60 Remote Control and Drill Cable is surface marked "P-105 BM."

It Costs Less To Buy the Best

ROME CABLE CORP., Dept. C-11, Rome, New York
Please send complimentary copy of "The Story of Rome Cable Corporation."

Name .....

Company .....

Address .....

City ..... Zone ..... State .....

ROME CABLE
Corporation
ROME • NEW YORK
From Bar to Finished Wire

ROME CABLE ROME, N.Y.

4 Wheel Drive PAYLOADER

The Model HM is the biggest "PAYLOADER" and the most powerful wheeled tractor-shovel ever offered. This mighty workhorse is equipped with a 1½ cu. yd. bucket and has many profitable uses at both open pit and underground mines.

Some of its many applications are cleaning tops of coal veins, feeding stripping shovels, loading trucks, maintaining roads, moving tools and supplies . . . lifting, pushing, carrying.

Other features contributing to the outstanding performance of this PAYLOADER are the fully reversing transmission with four speeds in each direction, power-boosted steering, powerful hydraulic brakes and full double-acting hydraulic control of the booms and the bucket. The bucket can be quickly replaced by a bulldozer blade, crane hook or lift fork attachment.

Your Hough Distributor has full facts for you on the Model HM. See him today or write to The Frank G. Hough Co., 735 Sunnyside Avenue, Libertyville, Illinois.

WRITE for literature on the Model HM or any other size PAYLOADER: the 1¼ yd. Model HL; the ¾ yd. Model HF; the ½ yd. Model HE; the 12 cu. ft. Model HA.

SAY "HUFF"

PAYLOADER®

THE FRANK G. HOUGH CO. • *Since 1920*

EATON

2-Speed Truck

AXLES

for the life of your trucks

They increase truck life . . . they last the life of the truck—that's what operators say about Eaton 2-Speed Axles.

They give extra vehicle miles because the driver has twice the conventional number of gear ratios at his command. He selects the ratio best suited to operating conditions, with less strain on engine and power transmitting parts. The engine runs at peak efficiency, saving gasoline and oil.

Eaton Axles match the truck for durability. The exclusive planetary system permits rugged construction and minimizes load on any one gear or bearing. Wear is reduced by another exclusive feature—forced-flow, positive lubrication.

Get full information about Eaton 2-Speed Axles (on most 1½ ton and larger trucks) from your truck dealer.

Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

EATON PRODUCTS: SODIUM COOLED, POPPET AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS SPRINGTITES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

A special 2¼-yd. coal loading dipper is available for the fast, dependable 38-B shown here. Standard dipper is 1½-yd.

Stand-Out On the Coal Seam

BECAUSE they load fast and load big . . . because they stay on the job year after year for dependable output . . . because they're easy on the operator and low on operating and maintenance costs — these are some of the reasons why Bucyrus-Eries are such outstanding performers on coal seams all over the nation. Experienced Bucyrus-Erie design provides the balanced speeds and power that mean a fast, smooth cycle. Careful laboratory control of materials puts strength and durability into every part. Simple, easily accessible machinery means less time out for servicing and maintenance. Your Bucyrus-Erie distributor has full information on ⅜- to 4-yard gasoline, diesel and single-motor electric excavators. See him for complete details.

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

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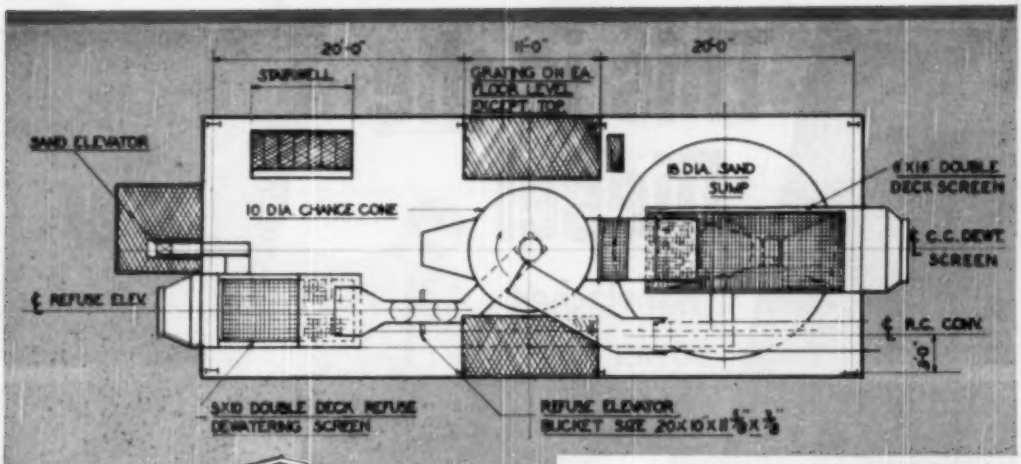

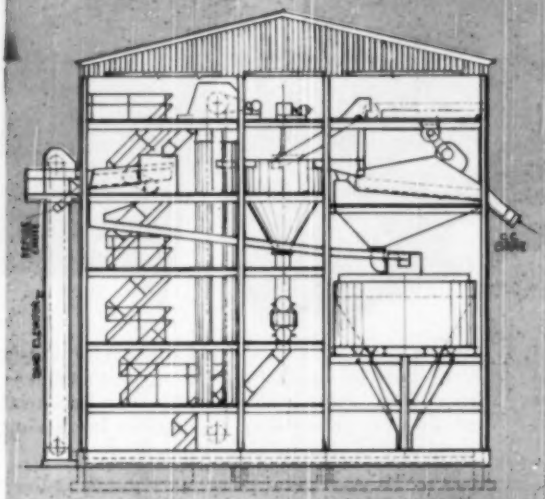

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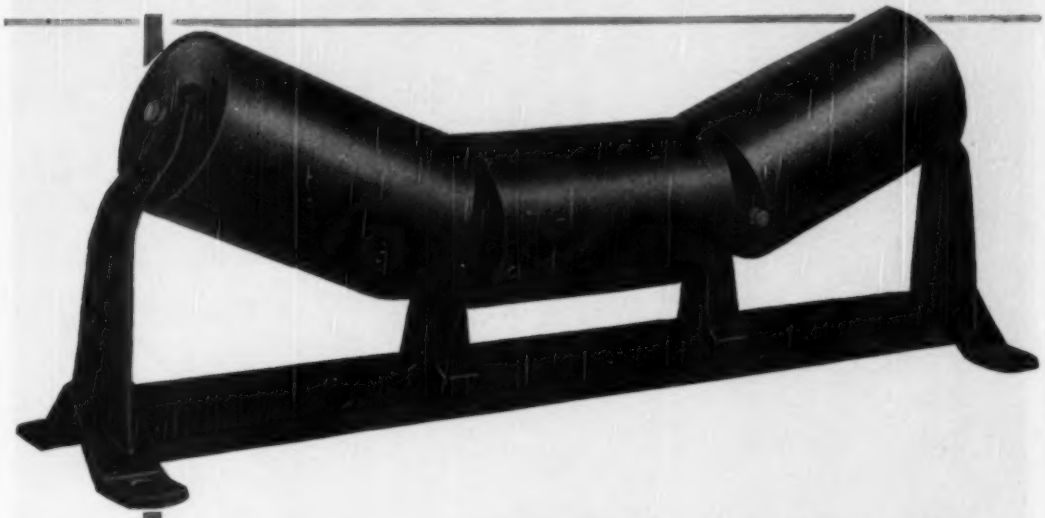

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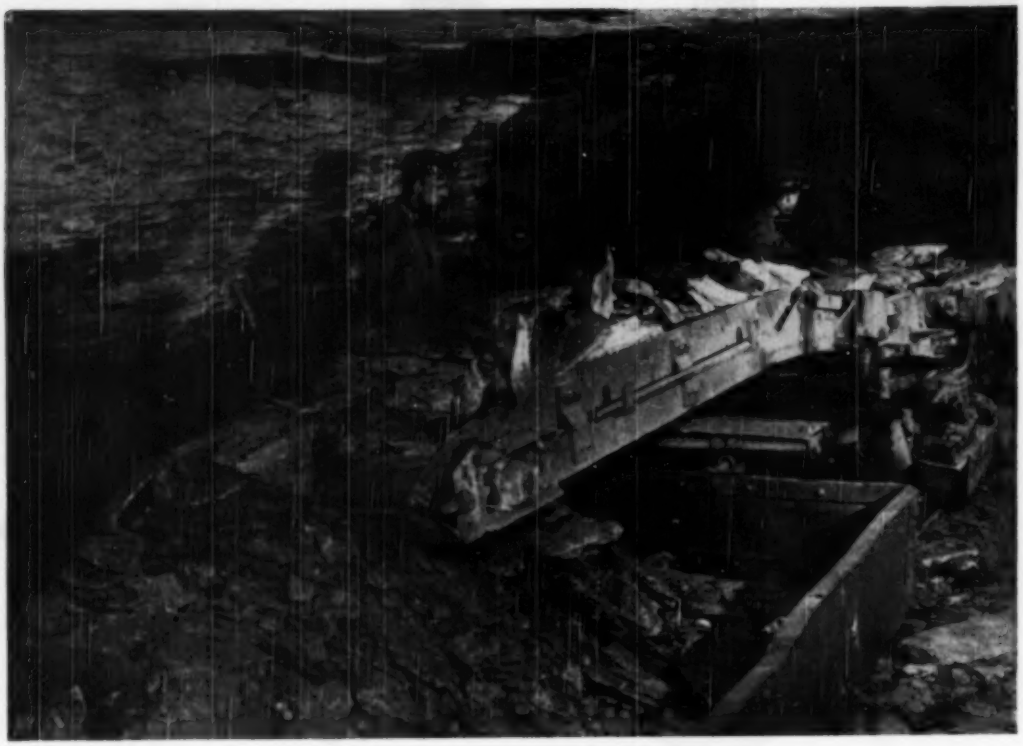

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Standard commercial ball bearings	YES	YES	YES
Larger grease reserve than provided with any standard bearing	NO	YES	YES
Grease supply free of churning action	NO	NO	YES
Measuring unnecessary to prevent overgreasing	NO	*YES	YES
Unnecessary to grease equally at each side of ball race	NO	YES	YES
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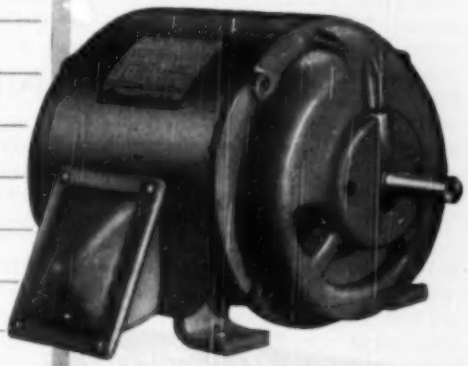

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

NOVEMBER, 1950

IVAN A. GIVEN, EDITOR

More per Dollar

PERHAPS signifying a trend toward getting more out of substantial investments in preparation facilities is the action of at least one stripping company in inaugurating two-shift loading and preparation-plant operation. Loading and preparation, with only occasional exceptions, has traditionally been a one-shift proposition in stripping. In contrast, as an accompaniment of mechanization of loading, deep mines quite a while back went to two- and three-shift operation of preparation plants. An obvious advantage is a greater output for the same expenditure for preparation facilities. At deep mines, in addition, it has often been possible to materially increase output with the minimum in mining facilities by effectively using these facilities on more than one shift.

The problem is not so simple at strip mines, where stripping capacity governs the quantity that can be produced. Consequently, double-shifting at a strip mine involves, among other things, extra expenditures for stripping facilities as a general rule. But if there is no other bar, and the same or a greater tonnage can be produced per dollar of extra stripping investment, there should be a net gain through better utilization of preparation facilities.

Now's the Time

AS DEFENSE PLANS develop, it becomes more and more apparent that the materials that go into coal-mining equipment and plants will become tighter and tighter. Factory and construction labor also will become scarcer, and, finally, the cost of everything will leap or inch up, depending upon how hard controls are clamped on. In other words, coal, along with other industries, will have a harder time of it in building new mines and plants and in obtaining new equipment for raising efficiency and product quality—much harder than in the past several years, when practically all jobs have taken two to three times longer than the normal before and in the early World War II years. The moral is clear. If there is any chance that new facilities or new equipment will be needed in the next two or three years, now is the time to get it on the manufacturers' books.

New Trial

ANOTHER TEST of the effectiveness of the contract-negotiating machinery in the coal industry, particularly in the bituminous branch, can be expected not later than early 1951. The pattern is being set not only by the statements of principals, as summarized in the feature beginning on the following page, but also by developments outside the industry. The rush to grant wage increases initiated by the automobile industry is an example of the latter, and adds to the pressure being generated by tax increases and the rising cost of living. When coupled with renewed declarations by Lewis that the mine workers still expect a substantial share of the benefits of increased productivity and that the strike weapon will not be relinquished, these and other developments add up to new demands backed up by threats of industry shutdowns.

With an improved bargaining set-up and a better understanding of what needs to be done, there is, nevertheless, real reason to hope that the demands can be resolved and new agreements worked out without the stress, strain and losses of the past. Unity, strength and a down-to-earth approach are the keys. A firm foundation has been laid. By building on it without delay, the desired goal of real labor peace can be attained that much sooner.

MR. LEWIS: "It seems wiser at times to settle by negotiation rather than through prolonged industrial struggle."

MR. MOSES: "There isn't any question that the industry has been at times its own worst enemy."

Outlook for Union Relations

Will Mr. Lewis demand an increase for the miners before Apr. 1, 1951—the date set for possible reopening of the present contract?

If Mr. Lewis makes new demands, either soon or later, what is the chance for even-tempered talks and a quick settlement?

Pressure for a Wage Boost

ONLY MR. LEWIS KNOWS now whether he will ask for a wage boost for the miners in advance of the contract-reopening date. But there are straws in the wind. Though Mr. Lewis doesn't bend easily with the wind, this time it's blowing in the direction he always moves in—more for the miners.

Here's the way the straws are blowing:

1. The big auto makers recently volunteered wage increases for their workers.

2. Other big unions, notably steel, have started wage drives.

3. The cost of living is up. In March, 1950, when the present coal contract was signed, the index was 167; in August, 173.

4. To curb inflation growing from defense spending, a wage-price freeze looms as a possibility, though it probably won't come until after the November elections. Mr. Lewis may seek all he can get before the door slams.

5. The defense program will strengthen coal's markets. Mr. Lewis will want his share.

6. Newspapers report that Mr. Lewis' aides have been hinting at an early wage adjustment.

Thus there's a chance that Mr. Lewis may jump the gun on contract reopening. He never has been one to trail the pack. He prefers to lead it.

The Three Top Negotiators

THE PERSONALITIES, the aims and the strength of the three top negotiators will determine, soon or later, whether the chances are good for constructive bargaining and a quick and satisfactory settlement.

Mr. Lewis, the UMWA president, has fought in the front lines of labor's battle for more than a generation. Time and age have not mellowed him. He still is a ruthless adversary and an agile strategist at the bargaining table. To present his views, *Coal Age* quotes below from his Labor Day speech, Sept. 4, 1950, celebrating the fiftieth anniversary of UMWA Local 1536, Coaldale, Pa.; from a memo, dated Aug. 29, 1950, to William Green, president, American Federation of Labor; and from a letter to the editor of *Coal Age*, dated Sept. 11, 1950, commenting on a recent McGraw-Hill economics study that explored the possibilities for great growth in the U. S. in the 1950-1960 decade.

Joseph E. Moody learned the ins and outs of personnel management and labor relations in other industries. In 1947 he became president, Southern Coal Producers' Association. Since then, with courage and conviction, he has upheld the interests of the SCPA at the bar-

Photos of Mr. Lewis and Mr. Moody: Wide World; Mr. Moses, Business Week.

MR. MOODY: "Control of the industry passed from the coal operators to the president of the UMWA."

MR. LEWIS: "How much for each? That's debatable in the marketplaces. That's collective bargaining."

gaining table. His views on bargaining methods and issues are taken from his address at the convention of the National Petroleum Association at Atlantic City, N. J., Sept. 14, 1950.

Harry M. Moses became head of the Bituminous Coal Operators' Association when this new group was formed Oct. 1, 1950. For 39 yr preceding, he worked with H. C. Frick Coke Co., a United States Steel subsidiary. From 1938 until he took on his new job, he was president of the company. An experienced bargainer for the "captive" interests, he is also a longtime friend of Mr. Lewis. He has known Mr. Lewis, he says, "ever since I was a little dirty-faced squirt of about 10." Some weeks before Mr. Moses left the Frick company, a reporter for *Business Week* made a wire recording of an interview with Mr. Moses. The interview was published in *Business Week* Sept. 23. Mr. Moses' views are taken from that interview.

The Union — Bane or Blessing?

Here's How Mr. Lewis Sees It

"[The miners] needed themselves to organize and through their own power and their own strength secure for themselves and their families and their neighbors some of those privileges of American citizenship which were withheld from them by unfeeling employers and a cold and disinterested community. They recognized that those who do not undertake to help themselves will be little helped by those who are concerned in other matters. . . .

"But the accomplishments of the last 50 yr have justified the judgment of the founders of this organization. There has been demonstrated that those who fight for themselves to improve their own lot are likewise able at times to lend their strength to their neighbors and their fellow citizens. And that has been the record of the UMWA. . . .

"The UMWA has fought this fight. . . ."—*Labor Day Speech.*

"Your survey failed to give recognition all along the line to organized labor for the enactment of workmen's compensation laws, public old-age benefits, aid to widows and children, old-age pensions, unemployment benefits and the present social-security laws that the 81st Congress only recently amended. . . .

"In similar fashion, you forgot to chronicle the work of organized unions in seeking abolition of child labor which in turn gives every youth an educational opportunity to possess fuller knowledge and greater development of his intelligence, thus enabling him to become more proficient in his contribution to the work of the Nation. The work of the unions in eliminating sweat-shop conditions has been a most magnificent contribution to the welfare and prosperity of the legitimate units of business which are entitled to fair play in the areas of national competition. . . ."—*Letter to Coal Age.*

Here's How Mr. Moody Sees It

"For many years, this Southern field was non-union and was the factor that held the UMWA in check because no matter what strikes were called to force concessions for the Northern companies, there was always a supply of coal to keep the Nation going. Starting with the NRA and later the Wagner Act, this area was finally organized. The result was that control of the industry passed from the coal operators to the president of the UMWA. Shortly after this, the Steelman decision gathered the 'captive' mines into the fold and the job was done. All of the operating groups were then organized. . . ."—*Speech to National Petroleum Assn.*

Here's How Mr. Moses Sees It

Business Week: What do you think of Mr. Lewis?

Mr. Moses: He is the most imaginative and capable labor leader of our time—certainly the most formidable who has ever confronted us. He is a fellow who went forward in fields that others didn't dare move in until he had opened them up.

BW: You mean organizing the mass-production industries?

Mr. Moses: Sure—and in the field of social benefits. . . .

BW: But you can't ignore the fact that the coal industry is in

Union Relations—How the Men, the Issues and the Outlook Add Up

MR. MOSES: "We have no desire to disrupt or destroy the Southern producers or do them any damage. We hope we can cooperate."

MR. MOODY: "Industry-wide bargaining will sooner or later lead us down the road to socialism and nationalization."

bad odor. Who's responsible for that?

Mr. Moses: Anyone who would attempt to divide the blame would be jumping to an empirical conclusion that I want no part of. There isn't any question that the industry has been at times its own worst enemy, but fixing the blame would depend on who was making the study. The rapid growth of the union and the union's desire to get benefits in periods when benefits generally weren't being granted has led to some disorders. . . ." —*Business Week interview.*

Labor Laws: Help or Hindrance?

How Mr. Lewis Feels

"The right to strike is inherent in a free country. And the right to strike cannot be taken away by statute without making the individual a serf and subject to the terms and conditions of his adversaries. That's the reason that the Taft-Hartley Law is a pestilence, a scourge and an abomination in a free country. The Taft-Hartley Law makes a second-class citizen out of a man who belongs to a labor union and has his services to sell, because the Taft-Hartley Law seeks to place the organizations of labor in an inferior and weakened position in the face of their adversaries in the so-called collective-bargaining process.

"The Taft-Hartley Law, conceived by Senator Taft at the request and with the support of the organized employers of this country represented by the NAM and other similar organizations, was designed to impede the growing strength and the progress which the unions of labor in this country have been making in recent years. It palls from the standpoint of Americanism. It is a treachery to the principles of the Constitution. It is a humiliation to every man who belongs to a labor union and to every member of his family who is dependent on his toil. . . ." —*Labor Day speech.*

How Mr. Moses Feels

Business Week: Would repeal of the Taft-Hartley Act make any difference?

Mr. Moses: It would just be power against power, and that's generally how it ends up anyway. . . .—*Business Week interview.*

How Mr. Moody Feels

"Starting with the NRA and later the Wagner Act, this area was finally organized and the result was that control of the industry passed from the coal operators to the president of the UMWA. . . . In 1948 the UMWA refused to meet with us and would not recognize me as president of the SCPA in any meeting called for negotiating purposes. . . . We appealed to the NLRB under the Taft-Hartley Act and Judge Allan Goldsborough granted an injunction forcing the UMWA to meet with us for collective bargaining. You can imagine the nice relationship that this brought about. . . ."—*National Petroleum Assn. address.*

What's the Government's Role?

This Is Mr. Moses' View

Mr. Moses: We want to be left alone.

Business Week: By the union?

Mr. Moses: I'm talking now about government intervention. It's been to blame for a couple of our most serious disorders in the past.

BW: How so?

Mr. Moses: Why, by seizure of our properties and refusal to return them until we had given the union everything it had demanded.

BW: Do you want any legislation or anything from any of the government agencies?

Mr. Moses: That is not contemplated. . . . What we need is to be left alone. There is too much government interference already.—*Business Week interview.*

This Is Mr. Lewis' View

"We have had experience before with the operators of the anthracite and bituminous industries in refusing to negotiate until the government exercised its oppressive sanctions and stripped the UMWA naked at the bargaining table in the presence of the employers. They tried it last year. You know how many months it took to complete negotiations for the last contract because the op-

erators believed that the punitive provisions of the Taft-Hartley Act would finally bring UMWA to its knees and institute a number of great suits at law where they hoped the government would convict our union and fine our membership some millions of dollars. When it finally turned out that an honorable judge refused to hand down such a decision, the operators capitulated within three days, and we had a contract. . . ."—*Labor Day speech.*

This Is Mr. Moody's View

"If, however, we grant, as we have at present in the coal industry, such a condition [a rigid level of labor cost], then that much of our cost is out of competition and causes a pressure on other factors, such as production. The result is that some people feel that there should be a control of production and thereby a control of price and markets. There is but one end to such a parade of events, and that is nationalization of the industry. We are opposed to such a catastrophe. . . .

"You may be interested to know that in many of the fights we have had in our efforts to maintain a balance of power and control of the industry, the final decision was the result of government intervention. . . . During the period 1943 to 1947, the government seized the mines and held them for well over half of that time. Here is a list of the concessions that were granted by the United States government during these seizure periods:

"May to October, 1943—Vacation pay; blacksmithing; safety equipment; all tools; pay increases.

"November, 1943, to June, 1944—Travel-time pay; portal-to-portal settlement; pay adjustment.

"September, 1944, to February, 1945—The issue of unionization of supervisors was presented and was a matter of controversy for the next two years.

"April to June, 1945—First nation-wide contract for the industry.

"May, 1946, to June, 1947—Wage increase of $1.85 per day; inclusion of the Federal Mine Safety Code in the contract; establishment of union mine safety committees with power to close the mine; compensation and occupational-disease coverage; welfare and retirement fund; medical survey; $100 cash vacation pay with pro rate payments; unionization of supervisors under the NLRB ruling.

"This last concession was refused by the SCPA and was fought by them until the NLRB finally reversed its ruling." — *National Petroleum Assn. speech.*

How to Bargain—And What For

Mr. Moses Sees It This Way

Business Week: Now what about the relations between your new group and the UMWA?

Mr. Moses: Well, it's certainly not an organization being built up to be anti-UMWA, but to attempt to stabilize our relations in that field. The matter of safey in coal mines or anything that is in any way related to our contractual relationship is a job for this organization. We naturally expect to keep our case before the public in a favorable manner, as does the UMWA. Our function is dealing with the UMWA under our contract. . . .

BW: But what about the Southern producers?

Mr. Moses: We have no desire to disrupt or destroy the Southern producers or do them any damage. We hope that we can cooperate. If they aren't willing, we'll have to do the job our own way. I don't anticipate any miracles.—*Business Week interview.*

Mr. Moody Sees It This Way

"The coal industry is broken into several competitive groups. . . . Differences in freight rates definitely limit the ability of coals of certain sections to reach certain market areas because the difference in freight rates is so great that it would be prohibitive. . . .

"With this, we have a national labor contract that establishes a level of basic rates that does not consider the differences found between districts or between mines. And no two mines are the same. Thus there is lost any ability to take advantage of the low-cost mine or to adjust labor costs to meet competitive conditions in an industry where 62% of production cost is direct labor cost. . . .

"The union carried out a very forceful campaign to establish a national contract, aided at times by some management groups of the industry. The Southern group has opposed this throughout the years in every way available to us. We believe that it is impossible to establish terms on a national basis that are fair and equitable to the various groups in the industry. . . . A rigid level of labor cost is ruinous in normal competition. . . .

"That is the story of industry-wide bargaining. The price may be high to avoid it but there is no price too high to pay. Industry-wide bargaining will sooner or later lead us down the road to socialism and nationalization. . . ."—*National Petroleum Assn. speech.*

"Many of the recommendations that you make in your article [*Coal Age*, Sept., 1950, p. 70] have been part of the Southern Coal Producers' Association policy, so your comments should not be about something that should be done in the future but rather that they are things that have been done. I refer specifically to our recommendation of proposals being made for negotiation. As you know, we did offer specific proposals in June and again in October. . . ."—*Letter to Coal Age.*

Mr. Lewis Sees It This Way

"The UMW stand for the participation in increased industrial efficiency. The UMW reject the theory that the cost of living should be used to decide the wages of the workers. The UMW reject the theory that they only want increases in wages when the price of milk or meat or shoes or shelter goes up. The UMW want a participation in the increased profits of industry coming from new efficiencies and modern methods so that the investor and the operator will not be the sole beneficiaries of all the improvements of modern techniques. The UMW insist that they shall have their share of any improvements in the methods of mining. . . .

"Now what is a reasonable share? Under our form of government, there are three parties to participate in new improvements, new efficiencies, new inventions, new formulas meaning increased productivity:

"1. The investor, whose investment is made more secure and more profitable.

"2. The worker, whose hours are shortened, whose wages are increased, whose conditions are improved, and whose life is safeguarded to a greater degree by pensions or what have you.

"3. The public, who gets a unit product at a lower price.

"Those are the three.

"How much for each? That's debatable in the market places. That's collective bargaining. That's what we sometimes agree upon and that's what we sometimes fight about. But the caviling and the controversy in the marketplace is just as old as people are free. . . ."—*Labor Day speech.*

Why Have Strikes?

How It Looks To Mr. Moody

"In April, 1949, we had a Memorial Period of about two weeks. . . . In June, we had a one-week 'stabilization' period. And starting July 1, we had a three-day week; September 19, a 'no-day' week; November 9, a six-day week; December 1, a three-day week; and February 2, a 'no-day' week. That is industry-wide bargaining. . . ."—*National Petroleum Assn. speech.*

How It Looks To Mr. Moses

"The rapid growth of the union and the union's desire to get benefits in periods when benefits generally weren't being granted has led to some disorders. . . ."*Business Week interview.*

How It Looks To Mr. Lewis

"We want a share. And we'll fight for it. . . .

"The only difference between freedom and serfdom is the right of the buyer to buy or refuse to buy and the right of the seller to sell or refuse to sell. And the argument over these two points has been convulsing the marketplaces as long as there is a written record of man in a free country. . . .

"I think free men can win a war if you give free men a chance to win a war. In return, we only ask fair treatment on such problems as may arise. In return, we make no stipulations except the normal desire of every normal citizen to supply the country's needs and to discharge his obligation to his own family. . . ."—*Labor Day speech.*

"You know, Bill, that I am ever distressed whenever I have to disrupt the calm placidity of your ordered existence. Yet I suggest that the rights of American workers in industry should not be bartered to appease your innate craving for orthodox respectability. Consideration of the following items is therefore indicated:

"1. Although the mine workers have espoused labor unity, you have stipulated them out of the unity conferences. It follows that any mess you cook up with the CIO, if you can cook up any mess with the CIO, will of course have to be eaten by you, and you alone. We do our own cooking.

"2. You have stipulated the mineworkers out of representation on the select, star-chamber labor committee which you designated to please Symington. We gently advise that we will not be bound by your deliberations or commitments conducted or made in our absence. We do our own committing.

"3. The press chronicles you as plodding about the country seeking someone to whom you can give a 'no-strike pledge.' I am sure that you will pardon me when I suggest that the mineworkers are not yet ready for you to sell them down the river. Restrict your pledges to your own outfit. We do our own no-striking."—*Memo to Mr. Green.*

What About the Future in Coal?

Here's Mr. Lewis' Outlook

"The anthracite industry has perhaps the most reasonable relations between employers and employees, as represented by the UMWA, of any major industry in this country. . . . It seems wise at times to settle by negotiations rather than through prolonged industrial struggle. The bituminous coal operators are gradually learning that lesson. . . .

"So the record of the union stands for itself. Tomorrow is another day and the thing of greatest concern to every man and woman within the sound of my voice today is what will happen tomorrow and what opportunities will these little children who gather about us here have for the future. . . .

"As I speak to you today, the membership of the UMWA on the North American continent is the greatest it has ever been. Its membership is loyal. Its achievements are matters of record. Its budget is balanced. And from every standpoint, the UMWA is equipped to accomplish more for its membership in improved standards of living and greater opportunities and privileges and to make more of a contribution to our national and community life in the next 50 yr than has been the case in the last 50 yr. . . .

"Now we look to the future. We must continue to make our contribution to the nation, conscious of the fact that all anyone can do is to be honorable and conscientious and faithful to the trust imposed in him. . . ."—*Labor Day speech.*

Here's Mr. Moses' Outlook

Business Week: How far along are you now with the new organization?

Mr. Moses: Producers with an annual capacity of 150,000,000 tons are already committed.

BW: That would be the solid base of the new organization, sticking by it through thick and thin?

Mr. Moses: Yes. Although, of course, we hope that those who come in later would be just as determined once they overcome their original hesitation. . . .

BW: Will you be concerned primarily with contract negotiations?

Mr. Moses: Yes. But we hope that will be the smallest part of the job, although it is part of it. What we are going to do is seek orderliness in our day-to-day relationships. There has to be a clear understanding of our problems.

BW: What are the chances of getting that?

Mr. Moses: Pretty promising, I think. The agreement we are living under now gives us time to catch our breath. We've been one step ahead of the hounds for years and this is a chance to settle down and find out what the hell is going on. . . .

BW: There have been a number of references to your friendship with John L. Lewis. Have you talked with him about this?

Mr. Moses: Not formally.

BW: But?

Mr. Moses: Well, you know how Lewis is. He sometimes makes a point by parable.

BW: What was his parable on this point?

Mr. Moses: He said that if a fellow wants to stand out in the middle of the street with the traffic going both ways, it wouldn't be precisely preposterous if that fellow got run over.—*Business Week interview.*

Five Years of Trouble-Free Operation Marked up With . . .

Gas-Filled Transformer

Spruce River Reports . . .

Ability to Stand Up in Mine Service
No Shock or Fire Hazard in Operation
No Maintenance, Easy Moving and Dust Resistance

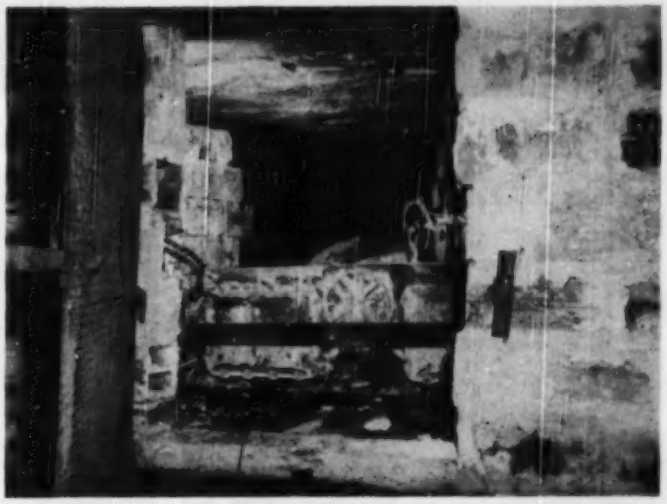
AFTER FIVE YEARS of being dragged around and serving in many temporary locations, a gas-filled transformer in No. 4 mine, Spruce River Coal Co., Ramage, Boone County, W. Va., is now working its way out of the mine as the barrier pillars are being taken in final retreat. To replace No. 4, Spruce River has developed a new operation—No. 8—delivering to the same tipple. No. 8 is being brought into production as No. 4 is worked out.

As planned by the tranformer builder and as expected by Spruce River, the gas-filled transformer has proved its ability to stand up in coal-mine service and its complete safety from the standpoints of shock and fire. In addition, it has been free of maintenance, is easy to reinstall in a new location and is not affected by mine dust.

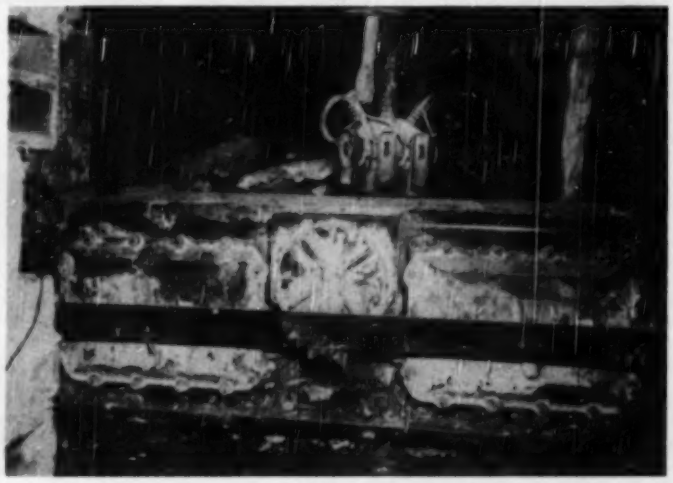
This Westinghouse "Mine Power Center" is a three-phase Type AVR Hipersil air-cooled transformer unit rated 150 kva, 2,400 to 240 volts, connected delta-to-delta. The enclosing case is sealed by welding and is filled with inert gas. Explosion-tested circuit breakers for primary and secondary are attached to the side of the case.

When asked to express his opinion of the gas-filled power center, Avrial Cook, chief electrician, stated that he would recommend purchase of that type if and when the company needs new transformers. His experience with single-phase transformers of the conventional oil-filled and dry types extends over many years.

No. 4 mine has been in the news for many years because it was one of the first in West Virginia to adopt ac power for face operations. Teamed with battery-locomotive gathering, ac has resulted in a very low per-ton power cost. As far back as 1929, *Coal Age*, in the November issue, reported on the reasons why the Spruce River company had a lower power cost than 148 other companies surveyed in 1928 by the West Virginia Engineering Co. J. O. Cree, of the latter company, speaking at the Cincinnati Mining Congress meeting last April, cited No. 4 mine as having held the record for low power cost in the Kanawha field (*Coal Age*, June, 1950).

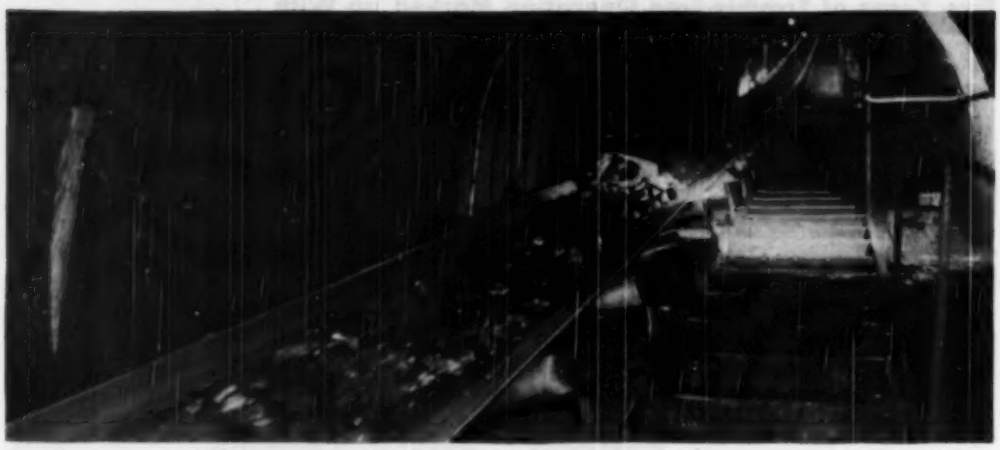


NOW SUPPLYING POWER FOR BARRIER RECOVERY, the gas-filled power center is here installed back of a tile stopping along the main haulageway at Spruce River No. 4 mine.



THE TRANSFORMER UNIT is in a welded gas-filled case. Two explosion-tested circuit breakers are attached to the side of the case and the entire unit is mounted on a skid base.

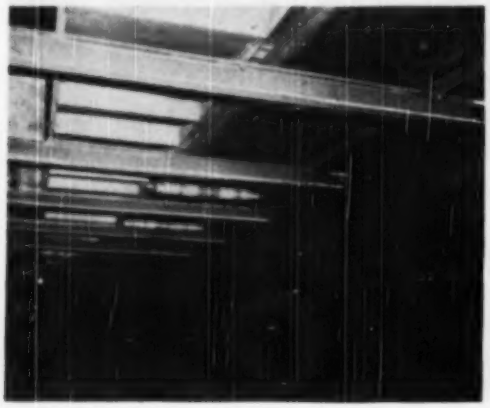
Pleasant View Teams Belts and Trackless Units With Modern Mine Design



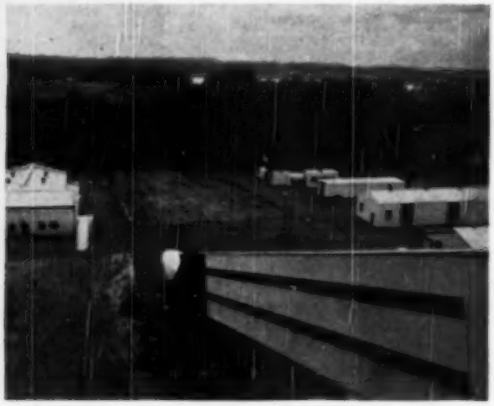
TRANSPORTATION KEYSTONE at Pleasant View is the conveyor belt. This slope unit, in the upper slope compartment, delivers coal to the preparation plant for mechanical cleaning, drying, screening and loading. Steel-tread stairway is at the right.

SHUTTLE BELT lays coal gently into 260-ton surge hopper equipped with dual feeders for placing the coal on the slope belt.

PADDLE SWITCHES protect both the slope belt shown here and the main-line and panel belts underground against spills.



SUPPLY TRACK in slope is placed in compartment to itself under compartment containing belt and steel stairway.



SURFACE FACILITIES include bath and lamp house (left) with underground entrance to slope, and fan and escape shaft (right rear).

EFFICIENCY IN MINING at Pleasant View is based on high-capacity crawler loaders and shuttle cars with elevating discharges, supplemented by rubber-tired cutters and drills and belt transportation to the preparation plant on the surface.

The Pleasant View Story

1. Trackless Mining . . . . . Belt Haulage

How Pleasant View Was Developed to Mine Coal With Crawler Loaders and Move It Via Shuttle Cars to a Panel and Main-Line Belt System Feeding to Shuttle Conveyor Over Surge Hopper and Bottom of Slope Belt

THE STORY of Pleasant View mine of the West Kentucky Coal Co., Madisonville, Ky.—trackless loading, belt haulage and mechanical cleaning and drying—is really the story of the company's earlier North Diamond No. 2 mine. Started in June, 1940, and worked out in May, 1950, North Diamond served as the guinea pig for East Diamond and Pleasant View—West Kentucky's two present-day modern deep-mining operations. However, the North Diamond preparation plant remains in operation for washing, drying and screening coal from part of the company's strip-mining properties, and will see service in this direction for some years yet.

Using crawlers, loaders and shuttle cars with panel and main-line belts, Pleasant View is mining the Kentucky No. 11 seam. The mine supervisory force is headed by Volney Wright, general superintendent, Pleasant View; Aubin Higgins, safety engineer; Carlos Byrum, day foreman; Everett Morris, night foreman; Will Cobb, chief electrician and master mechanic; Cleatis Overton, day washery foreman; Malon Ashby, night washery foreman; Ermit Wyatt, night superintendent; and Guy Littlepage, washery maintenance foreman.

Average thickness of the No. 11 seam at Pleasant View is 6 ft 2 in. Under normal conditions, it carries a "sheet band" up to ½ in thick 18 in down from the top, and a "blue band" averaging 2 in about 24 in up from the bottom, which is a soft fireclay about 10 ft thick. Immediately over the coal is 0 to 20 in of soft clayey shale, which normally peels off and falls. Over the shale, in most areas, is 4 to 5½ ft of limestone. Occasionally, however, the limestone is replaced by about 4 ft of black slate.

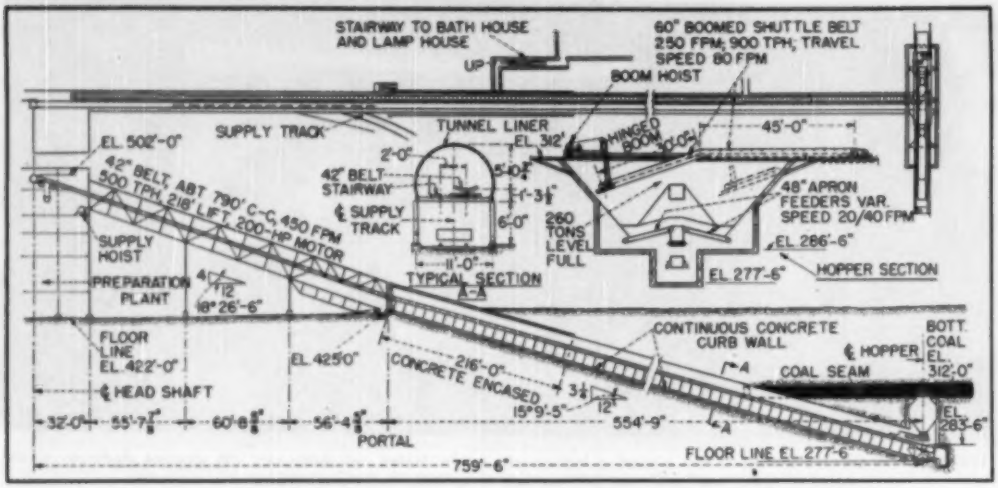
The mine is moist but not wet, the water seeping in through the fireclay. As a result, corduroying of shuttle-car roads with plank is required at times. Cover thickness is 125 to 150 ft.

The shale stratum immediately over the coal must be handled by loader and shuttle-car disposal. In room, shale or gob is thrown back by the loader in most cases. On the main entries, it normally is disposed of by coal loaders and shuttle cars in gob headings driven between panels as necessary. In panel entries, the material is stored in room necks on the advance. On the retreat, it is run back to worked-out rooms. A spare loader is provided to clean up airways and other special places.

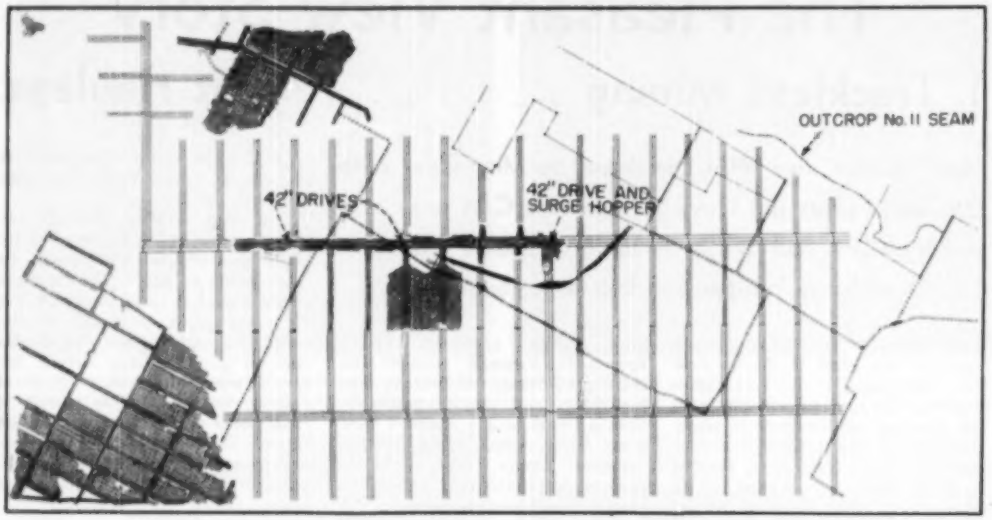
• **Slope Belt Hoists Coal**—Like North and East Diamond, Pleasant View is served by a belt slope. Unlike the other two, however, the slope is driven high to make two compartments, one above the other. The upper compartment accommodates the belt and stairway and the lower compartment the supply track.

Total length of the slope belt is 790 ft center to center. Length in the ground is approximately 570 ft. Inclination below the portal is 15 deg 9 min; above the portal, 18 deg 26 min. Total lift is 219 ft. The belt is a 42-in Goodyear Compass

The Pleasant View Story—1. Underground Operation



SLOPE AND SURGE-HOPPER DESIGN at Pleasant View. Slope compartments are one above the other, with the belt and stairway in the top and supply track in the bottom. The surge hopper has two feeders and coal is laid into it by a shuttle conveyor.

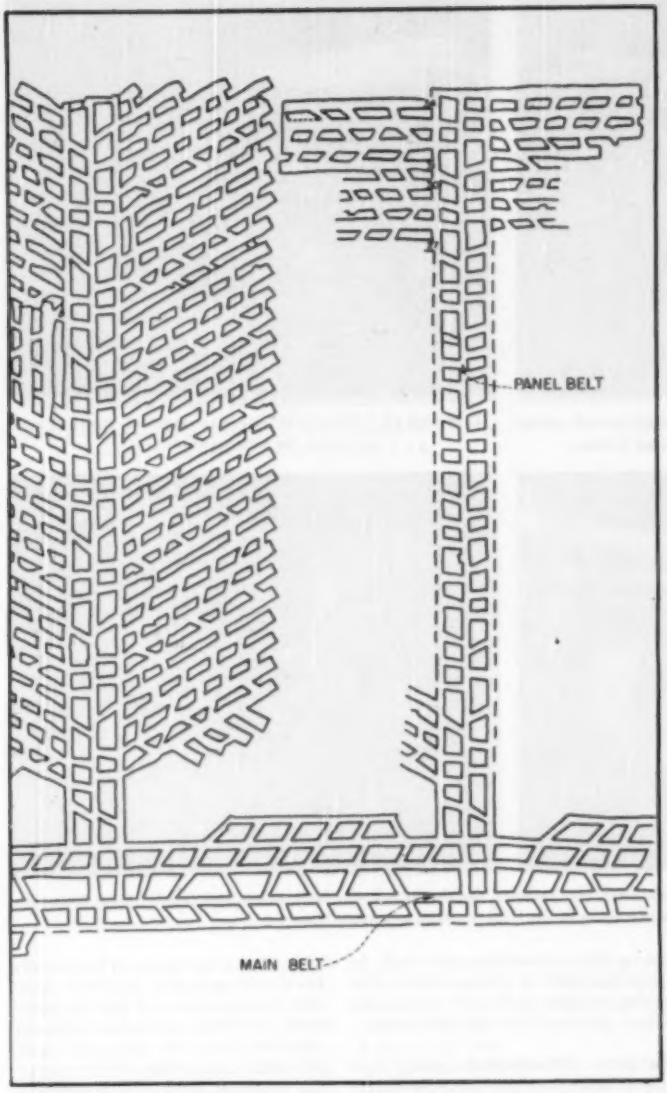


ADVANCE ON ONE SIDE and retreat on the other is the general mining plan at Pleasant View. Room panels are 1,500 to 1,800 ft long. Auxiliary headings between panels provide space for gobbing top material when necessary.

100 unit fabricated with cord. Operating speed is 450 fpm, and the belt is protected against spills at the top by paddles and knife switches. A Won-Way backstop is installed to prevent rollback. The belt is driven through a Jones reducer by a 200-hp Type CW Westinghouse wound-rotor motor.

In sinking the slope, starting in July, 1948, a dragline excavated down to the hard rock for a slope distance of approximately 80 ft. Sinking in the rock then was done in lifts of about 75 ft, using a 14BU Joy for loading, a 60-ft chain conveyor for the first stage of transportation, and a temporary 30-in belt for the final stage. Drilling was done with standard jackhammers. Length of the chain conveyor was limited to approximately 60 ft because excessive breakage occurred under heavy loading after that point. Slope inclination was limited to 15 deg 9 min to permit effective control of the loader on the grade.

• **Slope Sunk in Lifts**—In lift sinking, the lower section of the slope, approximately 14 ft wide and 7 ft high, was first driven approximately 75 ft. Then the reinforced concrete footings were poured on each side. Next, the top section was shot out in semi-circular fashion to provide a fairly close fit for the Armco corrugated tunnel liner. This liner, encased in concrete, is carried to a height of some 8 ft above the ground level, at which point the steel gallery to the preparation



PANELS ARE MINED RETREATING at Pleasant View. Latest plan calls for four-room sections turned at right angles on both sides of panel entry.

plant starts. The lower part of this gallery, carrying the supply track, is floored with concrete, including between the rails.

Installation of the corrugated lining, conveyor and conveyor structure, and steel stairway was done in 12-ft stages as the upper part of the slope was excavated. Therefore, when the slope reached the bottom, all that remained was to install the belt. Conveyor and stairway are supported on steel crossbeams resting on the concrete footwalls. The steel stair includes easy-walking treads 36 in wide and 24 in across, with 7-in-high risers.

In addition to the slope, a 10-ft round shaft was sunk for ventilation and a 7-ft round opening for an emergency escapeway. Both were sunk around pilot bore holes, through which the muck was dropped, and both are lined with Armco corrugated liner plate. The emergency shaft is fitted with a spiral stairway. The top is covered and fitted with an airlock for exit.

• Surge Hopper Feeds Belt—At the bottom, the slope belt is fed from a surge hopper with a capacity of 260 tons level full. The hopper is 16 ft wide and 66 ft long at the top. Maximum depth to the feeder throats is 18½ ft. Two throats and two 48-in apron feeders are provided for moving coal out of the hopper. Speed can be varied with P.I.V. gears. One feeder or the other may be used, depending upon the quantity of coal in the bin, but not both at the same time. A third 48-in apron unit at right angles deposits the coal on the belt.

Coal from the main-line belts is laid into the hopper by a 60-in 250-fpm Webster shuttle conveyor with 45-ft horizontal and 30-ft hinged section. The end of the hinged section can be lowered a maximum of 10 ft to reduce coal drop into the hopper. Since the shuttle conveyor moves back and forth and thus receives coal at varying points, the belt is carried on cushion idlers for its entire length. Maximum travel back and forth over the hopper is 68 ft. Motor equipment—all Westinghouse—is as follows: hoist, 15 hp; tram, 5 hp; belt operation, 15 hp.

• Rooms Worked One Side Advancing and Retreating—The general plan of mining at Pleasant View consists of advancing mains and working rooms on one side on the advance, then retreating on the other side. Mains consist of four headings 14 ft wide on 48-ft centers. Short gob headings, as previously noted, are driven as needed between panels on the outside of the main openings.

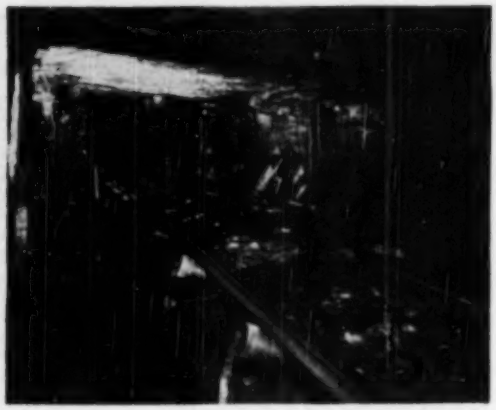
Panel entries are turned at intervals of approximately 700 ft, which permits driving rooms to a normal depth of 300 ft with a 15-ft barrier against the next panels on both sides and at the top. Three headings 14 ft wide on 39-ft centers are standard for panel entries, which range from 1,500 to 1,800 ft in depth. In a 1,500-ft panel, 34 rooms are turned on each side.

Room width is 25 ft; centers, 40 ft. Necks are driven in 2 to 3 cuts 14 ft wide as the panel entries are advanced. When the entries reach their limit, rooms are mined in groups of four on the retreat on both sides. Rooms originally were turned on an angle, but present practice is to work 90 deg, which experience has demonstrated results in more satisfactory operation.

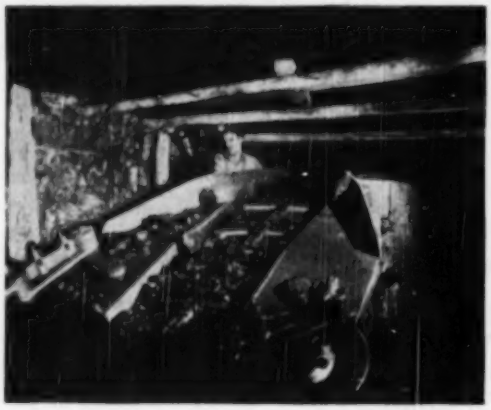
• Belts Handle All Haulage—Panels are served by 30-in Jeffrey

The Pleasant View Story—1. Underground Operation

PANEL BELTS discharge to main-line units through curved counterweighted chutes which lift to permit lumps to pass.



MAIN-LINE BELT TRANSFERS include sprays turned off and on automatically as the belts run empty or full.



LOADING CHAMPS with 891 tons in one shift are (left), Tex Cummings, operator, with Jennie Faulk, helper, and (right) Walter Fitch, foreman. A standard crew for the trackless mining units totals 13 men.

belt conveyors with Goodyear 5-ply 32-oz-duck belt. Maximum length of the panel belts is 1,800 ft. The drives are dc, using 50-hp G. E. motors and magnetic starters, and DeLaval speed reducers. Belt speed is 450 fpm. Extensions are made with Flexco fasteners.

From the hopper at the bottom of the slope, the main belts now in service, all vulcanized, are:

No. 1—2,818 ft center-to-center; 42-in Goodyear 5-ply 38-oz-duck belt; 500 fpm; Webster conveyor; ac drive with 220-volt 100-hp 580-rpm G. E. motor and Falk 6.46:5.80 speed reducer.

No. 2—2,200 ft center-to-center; 42-in Goodyear 5-ply 38-oz belt; 500 fpm; ac drive with 125-hp G. E. motor and Falk 6.46:5.80 speed reducer.

The next, or No. 3, belt, is designed for operation up to 3,200 ft in a future location and will be equipped with a 200-hp motor. The belts operate at present on an adverse grade of 1% to the bottom.

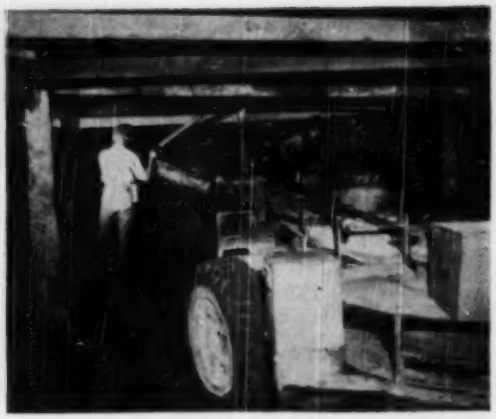
● **Belts Interlocked**—Main and panel belts are interlocked and protected by G. E. roller switches and relays to stop outby units with a minimum of coasting. Pilot lines over all belts protect against roof falls. Curved counterweighted chutes to permit passage of lumps from the rear are used at panel-belt transfer points, which also are provided with paddle-operated knife switches to protect against spills. Sprays are installed at transfers on the main-line unit and are turned on and off automatically in response to coal flow by pressure switches actuated by belt load.

The main-line and slope belts are vulcanized. Panel belts are spliced with Flexco fasteners. The average panel-belt extension is 250 ft, with 200 ft minimum and 350 ft maximum. A 300-ft extension normally requires about 10 men one shift. Moving a panel belt drive, including taking it down and mounting it in the new location, takes four men one shift, plus six to eight men a shift to put on the first section of belt, if all materials are at hand.

Drives, conveyor sections and belt sections are handled on rubber-tired Fletcher trailers pulled by Baker battery tractors. Belt sections are removed by running them down on the remaining belt to the first crosscut and then lapping them on the trailers. In installing them, they are brought in lapped on the trailer, which merely pulls ahead as the laps are pulled off.

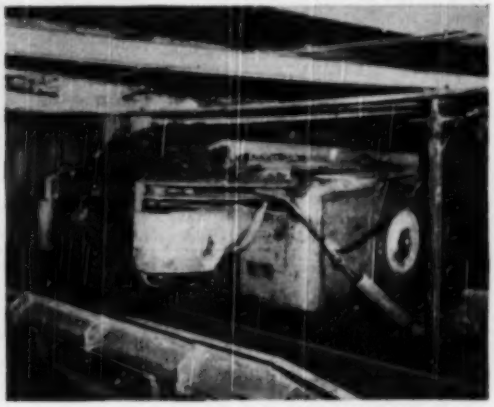
Belts are inspected and repaired underground, including vulcanizing.

CENTER-CUTTING AND SHEARING with rubber-tired machines start the face-preparation cycle. Bar length is 9 ft.



LATE-TYPE DOUBLE-ARM drill, using carbide-insert bits, puts eight holes in a center-cut and sheared room face 25 ft wide.

USING ELECTRIC DETONATORS and stemming material cut out of the fireclay bottom, coal is shot with 1½s permissible.



SHUTTLE CAR discharging to panel belt at air-locked transfer station. Spring anchor protects the cable against shock.

For this purpose, a vulcanizer is kept on hand and portions of the belt are run through as necessary. The process consists of pulling from one lapped pile through the inspection and vulcanizing station and then lapping on the other side. Repairs on the bottom side are made by lapping or doubling the belt back to bring that side to the top.

• **Seven Units Mine the Coal**—Seven trackless-mining units account for around 4,500 tons of washed coal in two shifts at Pleasant View. Reject in preparation runs 20 to 25%. Three of the units normally are employed in advancing entries and four in room work. Each room unit is made up of a 11BU loader; two 10SC shuttle cars with a capacity of 6 to 7 tons; a Sullivan CD-16 or CD-24 drill using Kennametal augers and bits; and a Sullivan 10RU cutting machine with 9-ft Bowdil bar using Bowdil alloy bits, plus hose connections for water. For driving entries, 14BU loaders are used.

The standard crew for a unit is made up of a foreman, loader operator and helper, two shuttle-car drivers, cutter and helper, driller and shotfirer working together, three timbermen and one mechanic, a total of 13. The record to date with such a crew, with Walter Fitch as foreman and Tex Cummings as loader operator, is 891 tons in one shift.

• **Shuttle Cars Provided With Separate Discharge Points**—In the four-place section usually worked, separate discharge points are provided for each shuttle car opposite Nos. 2 and 3 rooms. This eliminates cable interference between cars, since each car can travel a separate road between discharge station and passing point near the face. Opposite groups of rooms are staggered slightly to provide the opposite cars with belt-loading stations of their own also. In addition, this permits installing brattice-cloth air locks for each of the four stations, materially reducing airborne dust.

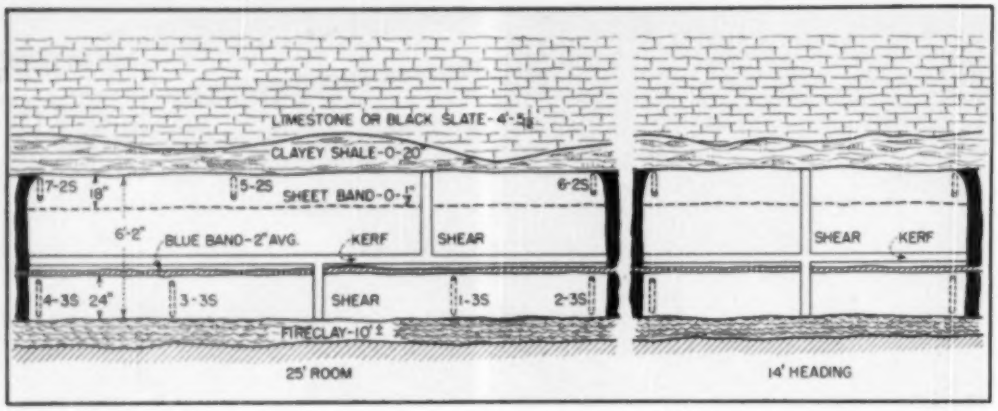
Maximum shuttle-car haul seldom exceeds 450 ft. For maximum production, experience has shown that places must be in about 75 ft. After that, with some slight drop-off at the end in some instances, that maximum is maintained throughout the life of the place.

• **Cutting and Drilling Standard**—All places are cut and sheared. Standard room and heading plans are shown in the accompanying sketches. In rooms, the cut is made

The Pleasant View Story—1. Underground Operation

MAN AND MACHINE PROTECTION is provided by circuit centers incorporating circuit breakers and ground-trip relays.

BATTERY TRACTORS with rubber-tired trailers handle supplies and conveyor belts and parts at Pleasant View.



CENTER-CUTTING AND SHEARING are the rules in face preparation at Pleasant View. Typical drilling and shooting patterns for both rooms and headings are shown in these plans, along with the bands normally present in the seam.

about an inch above the blue band. Then, as shown, the top is sheared about 8 ft from the right rib, and the bottom is sheared in the center.

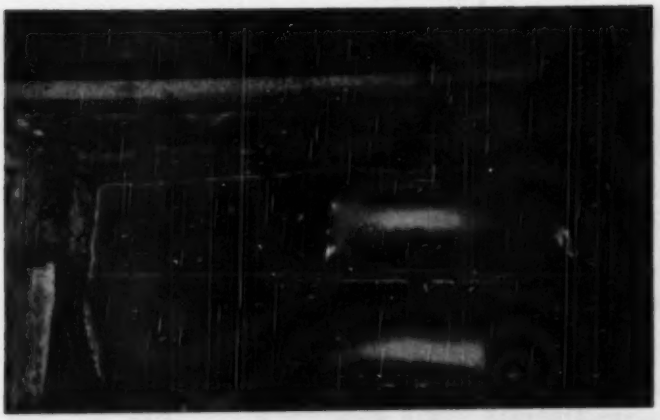
Four holes are drilled in the bottom about as shown, and three in the top. Normal loading is three 1½x6-in sticks of Liberty Big Coal D (114 sticks per 50-lb case) in each bottom hole and two in each top hole. The holes are shot in the sequence shown—bottom bench first and top bench last. Stemming material is obtained by shear cutting at intervals in the bottom, and the dummies are made up with Sealtite tamping bags.

Headings are center sheared and shot with four holes, one on each rib top and bottom. Occasionally, the shear is moved slightly to the left of center and a third hole is drilled in the center of the right-hand section in the bottom bench.

● **Bolts Supplement Timber**—Timbering is done with 4x6 crossbars on posts, except that bars are supported temporarily at the face with Simplex and Duff-Norton timber jacks. Bars are installed on 3½-ft centers and are recovered in room work by the supply men. On the bottom and along the belt heading, the practice is to bolt the roof with 2- to 6-ft bolts of the slot-and-wedge type. Bolt diameter is ¾ in, and both bolts and wedges are made by West Kentucky, using special gas-cutting apparatus. Joy chain-feed stopers are used for drilling and for tightening bolts with a built-in torque wrench.

Two Baker battery-powered tractors (Exide batteries) with Fletcher trailers are used for distributing supplies to the working sections and for handling belt, conveyor pans and drives, and other equipment, parts or materials. Supplies are brought in from the bottom by a track in the heading paralleling the belt heading. Where panel belts are encountered, the track is sunk for clearance.

● **Positive Ventilation Provided**—Air for Pleasant View is supplied by a 5-ft Jeffrey Aerodyne fan currently producing 102,000 cfm at a 3½-in water gage. The drive includes a LeRoi gasoline engine, magnetic clutches and a control center for automatically switching from motor to engine in case of power failure or motor trouble. Among other things, a trickle charger keeps the starting battery always ready for service.



PLASTIC STOPPINGS serve panel entries cheaply and effectively and have a high degree of reclamation for further use.

UNDERGROUND CONFERENCE—Aubie Higgins (left), safety engineer; Volney Wright, general supt.; John Wallace, section foreman; and Everett Morris, night mine foreman.

The mining plan is arranged for a separate intake on each side of the main entry and for a separate split for each panel. Stoppings along main entries are made of cinder block. Panel stoppings are Koroseal plastic battened to wood frames and plastered around the edges. Use of Koroseal started in 1947 and has been found entirely satisfactory for panels, which normally are driven up and completed in approximately 120 days. Ease of installation and a fairly high degree of salvage for further use as stoppings, or as curtains along belts, are among the advantages. Brattice lines or wings are used where necessary in rooms. Air volume at the last crosscut in panel entries is 8,000 cfm or more.

● **Boreholes Supply Power**—All operating equipment at Pleasant View is supplied with power through boreholes from the surface. A pole line feeds the substations located at the bore holes, which are drilled 2,000 ft apart to feed to the load centers. Separate holes are drilled for the ac loads, which are the main belts. DC conversion equipment consists of 300-kw stationary-type Westinghouse rectifiers.

Holes are drilled into pillars and are cased. Cables are taken out through notches in the side of the casing, and the bottom is welded shut, so that if a cable catches on fire and burns and drops, it cannot fire the coal. As an additional precaution, the hitches made to reach the bottoms of the holes are lined with cinder block, with entrances through metal doors.

Equipment in the working sections is protected by Mines Safety Circuit Centers with built-in ground-trip and circuit-breaker protection for both men and machines. Two centers are provided for each section. One three-breaker unit serves the loader, cutter and drill. A second two-breaker unit serves the two shuttle cars.

● **Surface Facilities**—Aside from the preparation plant surface facilities at Pleasant View include a combination supply house and shop for light maintenance; a storage building for heavy equipment, parts and materials; an oil house; an office; and a bath house with separate accommodations for white and colored miners (150 each) and supervisors (16). The bath house also includes the lamp room (Edison Model P lamps) with self-service racks. With the exception of the office and bath house, the buildings are Armco Steelox.

All buildings and other surface facilities, including the preparation plant, are painted cream with red trim, which is standard for West Kentucky properties and presents a neat and pleasing appearance. To complete the job, open areas will be planted with grass and supplemented with flower beds.

● **Service Labor Low**—One effect of belt transportation and fast extraction at Pleasant View and other West Kentucky operations is a low figure for service labor, meaning all mine labor except face crews. This, coupled with high production at the face, results in high tons per man.

Regular underground service labor at Pleasant View, for example, excluding construction, belt moving, and the like, normally is as follows for around 4,500 tons of washed coal or around 6,000 tons of raw coal:

Greasing and inspecting belt conveyors—Three men one shift.

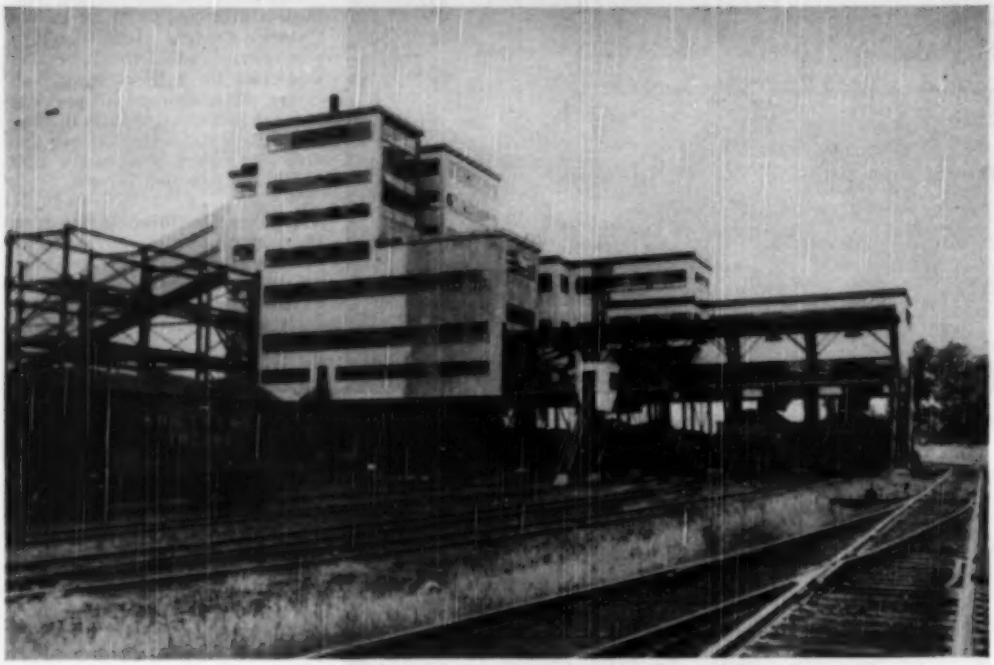
Belt attendants—Five men per shift or 10 per day.

Handling and recovering supplies—Ten men per shift or 20 per day.

Wire installation and maintenance—One man one shift.

Pumping—One man per shift or two per day.

Over the West Kentucky deep mines, tons per man engaged in service work, including idle-day and extra work, averages 27 to 28, or approximately 50% more than the average derived from a recent survey covering mines producing a substantial portion of the national tonnage.



PLEASANT VIEW PLANT IN ACTION contributing its share of the daily output of "Premium Washed Coals" produced and sold by the West Kentucky Coal Co. At the left is the framework for the new heat-drying addition.

The Pleasant View Story

2. Mechanical Cleaning . . . Drying . . . Screening

Shipping Over Seven Loading Tracks, Pleasant View Precision-Washes in Coarse- and Fine-Coal Circuits, Dries Both Mechanically and With Heat, Stage Crushes and Rescreens, and Treats With Oil and Calcium Chloride

LATEST in the group of plants producing West Kentucky "Premium Washed Coals," the new Pleasant View operation basically incorporates the experience gained in the design and operation of three other modern plants between 1940 and the present time. Thus, Pleasant View is in the main a duplicate of East Diamond, with the addition of crushing, rescreening and heat-drying to supplement washing, centrifugal drying and oil- and calcium-chloride treatment.

Pleasant View, like other recent West Kentucky plants, was designed by Roberts & Schaefer to incorporate ideas developed by the West Kentucky staff and was built by the company under the direction of F. R. Buckley, chief of the construction, preparation and design division, and Davis Read, until recently chief engineer in charge of production and now consultant.

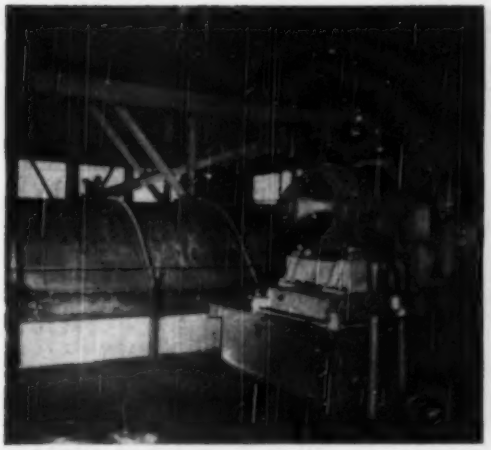
The product of the Pleasant View, other West Kentucky mines, and other mines represented by the company, is moved by a sales staff headed by R. H. Bowden, vice president and sales manager, with headquarters at the general offices at Madisonville, Ky. Regional wholesale offices are maintained at Chicago, Louisville, Ky., and Nashville, Tenn., with the F. P. Weaver Coal Co., Ltd., Canadian representatives.

Retail agencies are maintained at Nashville, Louisville and Paducah, Ky. Research and combustion are handled by a staff headed by George W. Land, director, and Kenneth Arnold, chemist.

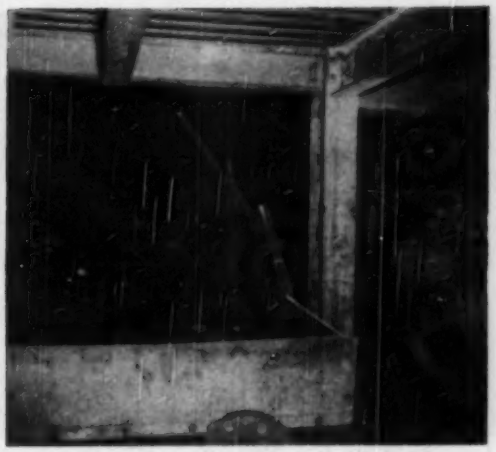
In full operation, the West Kentucky mines, either owned or represented, produce more than 30,000 tons of coal per day. With a rated capacity of 500 tons of raw coal per hour, Pleasant View presently contributes approximately 4,500 tons to that total. Precision washing at Pleasant View takes in the entire mine product and is accomplished in separate coarse- and fine-coal circuits.

Coarse-Coal Preparation

To start the preparation process at Pleasant View, raw coal from



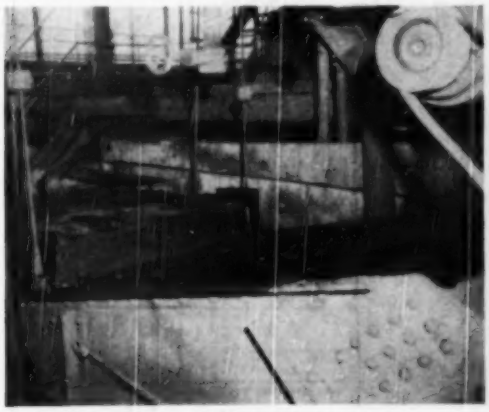
START OF THE PREPARATION CYCLE—mine-run from the slope belt is rough-cleaned and reduced to 6 in in this rotary breaker.



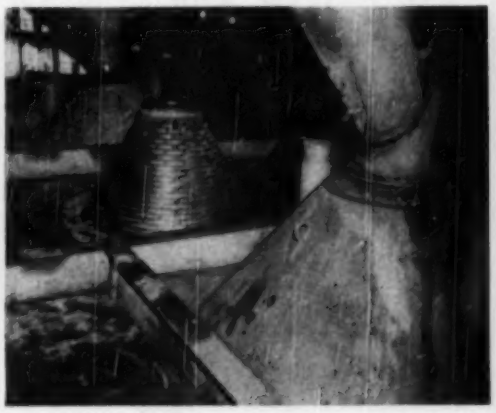
PRELIMINARY SIZING into plus and minus ¼-in fractions marks the start of the coarse- and fine-coal cleaning circuits.

COARSE COAL is washed in this and a second of two cleaning units in the coarse-coal circuit. Middlings are recirculated.

TWO UPWARD-CURRENT WASHERS clean fine coal and are followed by vibrating-type screens dewatering at 10 mesh.

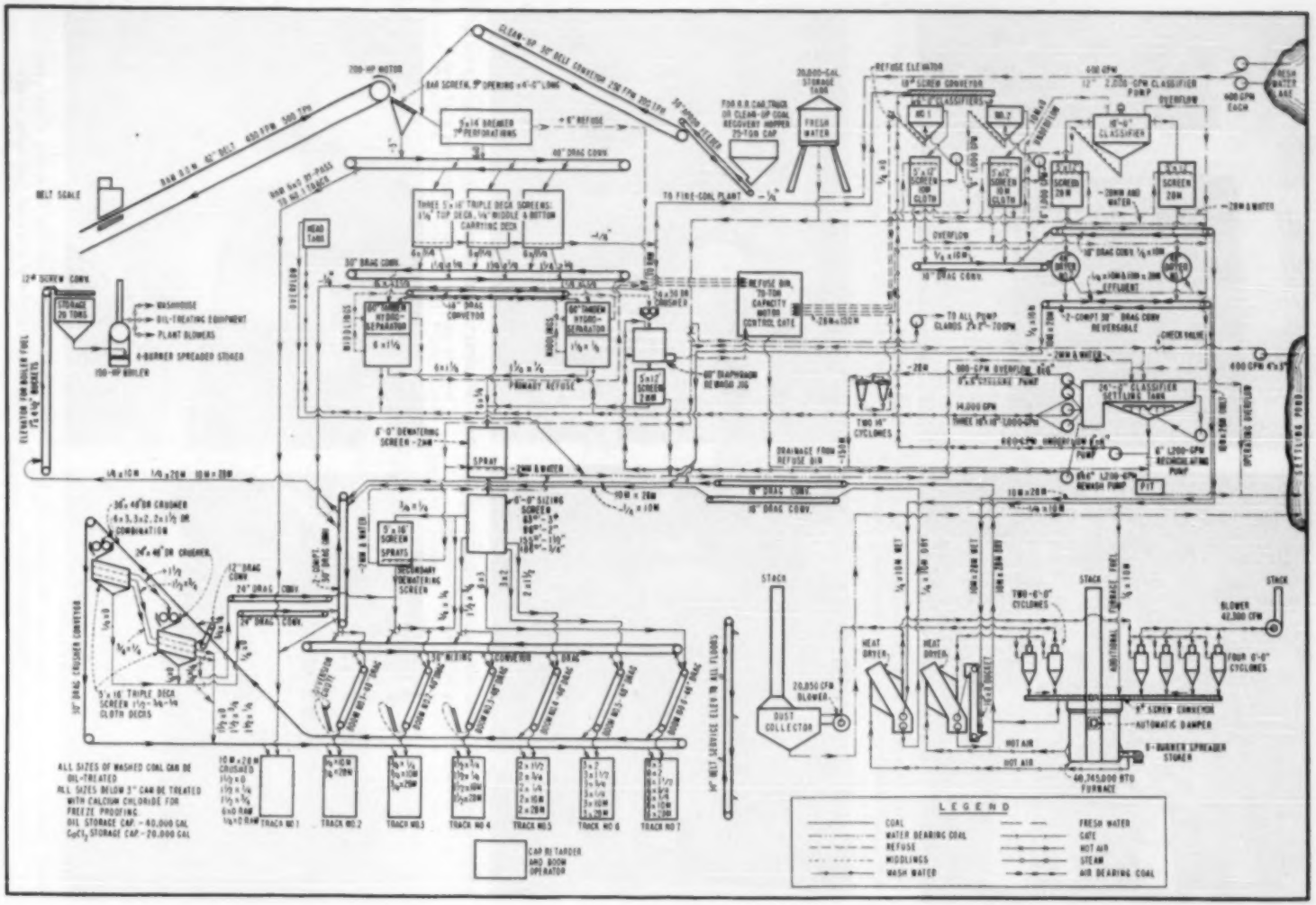


MINUS 10-MESH receives further cleaning in this classifier unit followed by a vibrating screen dewatering at 28 mesh.



CENTRIFUGAL DRYERS handle final dewatering of coal under ¼ in pending installation of a two-unit heat-drying addition.

PLEASANT VIEW FLOWSHEET—Including coarse- and fine-coal circuits, crushing and rescreening, centrifugal and heat drying.



the slope belt, after passing a Merrick Weightometer, is discharged to a bar screen removing the minus 5-in fraction. Coal over 5 in goes into a 9x14-ft Bradford breaker set to screen at 7 in. Refuse goes directly to the refuse bin, while coal through the screens joins the minus 5 in from the bar screens on a 48-in drag-type distributing conveyor. This conveyor distributes the coal to three 5x16-ft Allis-Chalmers Ripl-Flo vibrators for separation into 6x1¼, 1¼x¼ and ¼x0—the start of the coarse- and fine-coal circuits.

In the coarse-coal circuit, 6x1¼ goes to the top run of a 30-in distributing conveyor and from there to a 60-in R&S tandem Hydroseparator; 1¼x¼ is conveyed to a second 60-in Hydroseparator on the bottom run.

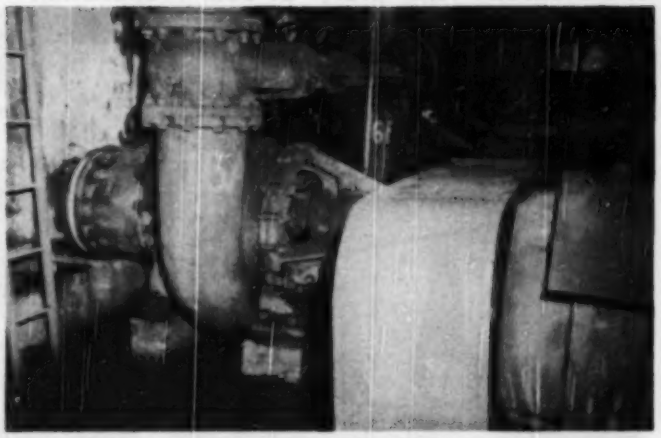
Material from the first draws of the two Hydroseparators is run to the refuse bin. Material from the second draws is recirculated. Water for washing is fed in from the main settling tank at a rate of 14,000 gpm. The washed 6x1¼ and 1¼x¼ is combined and flumed to an 8-ft-wide Parrish-type dewatering screen followed by a 6-ft-wide classifying screen. Dewatering is done on 2-mm wire, with the underflow going to the main settling tank. Spraying is done with clear make-up water.

The classifying shaker sizes the cleaned and dewatered coal into 6x3, 3x2, 2x1½, 1½x¾ and ¾x¼, which may be loaded directly or run to the mixing conveyor. Supplementary dewatering of the 3x4x¼ before loading or mixing is done on a 5x16-ft Allis-Chalmers Low-Head vibrator, if desired; if not, the screen can be by-passed.

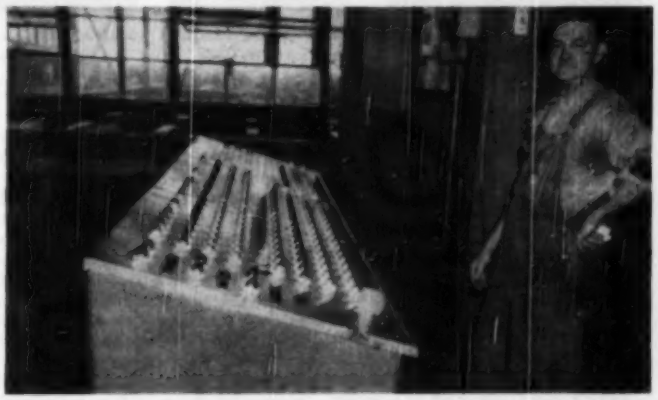
Fine-Coal Preparation and Drying

In the fine-coal circuit, raw ¼x0 is split between two 6-ft Hydrotator washers by an 18-in screw conveyor under the primary vibrators. Refuse goes to the refuse bin and cleaned coal to 5x12 Low-Heads for dewatering and screening at 10 mesh. Sprays have been added to the two 5x12-ft screens for use when heat rather than centrifugal drying is employed. As a result, surface moisture on the ¼x10 is reduced from around 18% without spraying to approximately 10% with spraying.

The ¼x10 coal from the vibrators, when the heat-drying addition now under construction is completed, will go to an 18-in drag con-



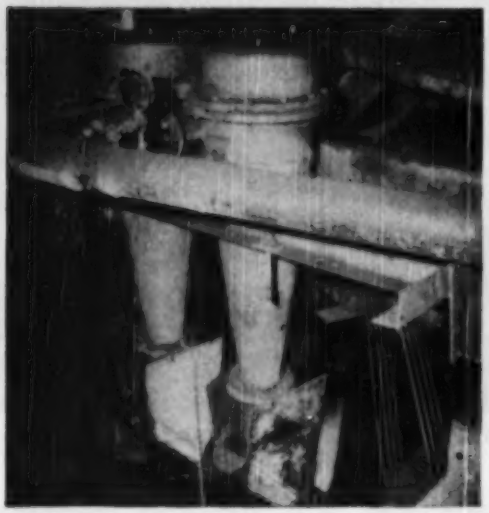
PART OF THE BATTERY of seven pumps installed at Pleasant View for recirculation, makeup and other water-handling purposes.



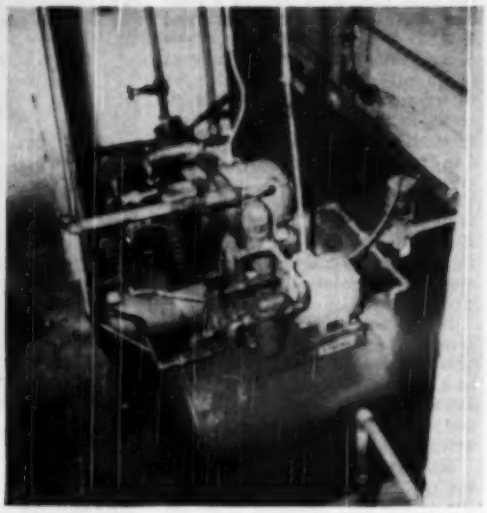
CONTROL OF ALL MOTORS at Pleasant View is centralized in this console-type board with buttons and indicating lights.

MOTOR-CONTROL EQUIPMENT is grouped in this control center, except for safety switches near each motor for maintenance use.

The Pleasant View Story—2. Coal Preparation



SETTLING-POND LIFE is increased by these two cyclone separators, which keep approximately 40% of the fines out of the pond.



DUSTPROOFING with 1,000-sec oil by the hot-oil process can be supplemented by freeproofing with calcium chloride.

veyor for drying in a C-M-I centrifugal dryer or for discharge to a second 16x3 drag conveyor feeding the heat-drying plant.

The 10x0 from the vibrators following the Hydrotators is sluiced into a 16-ft Hydrotator classifier, where the ash content is reduced from 15 to 17% to approximately 7½%. From the classifier, the cleaned product goes to a 5x12-ft Low-Head for dewatering at 28 mesh. Minus 28 and water go to the main settling tank. From the vibrator, the 10x28 goes to a second C-M-I, which reduces surface moisture from 25 to 30% to around 8%.

Plans were completed at the time this description was prepared for adding a second Low-Head and splitting the 10x28 between the two centrifuges at times when ¼x10 is being by-passed. After centrifugal drying, the 10x28 can go either to the loading point or to a second unit in the heat-drying plant.

The heat-drying plant under construction at the time this description was prepared will include two Link-Belt Multi-Louvre dryers—a 12x20 unit for ¼x10 and a 12x16 unit for 10x28. The ¼x10 may be fed direct to its dryer, but the 10x28 will always be centrifuged first to make possible handling the tonnage in a heat unit of this size. Dried coal will be returned to the loading point in a two-compartment drag conveyor installed to handle the two sizes under ¼ in—either centrifuged or heat-dried.

Screening and Loading

With ¼x10 and 10x28, Pleasant View is equipped to load seven primary sizes, including 6x3, 3x2, 2x1¼, 1¼x¾, ¾x¼, ¼x10 and 10x28, on seven tracks. In addition, prescription mixes can be made of any two up to all sizes by proper manipulation of slide gates in the mixing conveyor. In addition, all sizes down to ¼ in can be mixed in natural proportion on the classifying screen and then loaded over two booms by means of a split gate, with ¼x28 added, if desired, via the mixing conveyor.

Six loading booms are provided. Three are equipped with diversion chutes. Chutes were omitted on the other three booms handling the three top sizes because they are designed to discharge to a crushing and rescreening-plant feed conveyor.

All loading operations are controlled from an operator's tower in front of the loading bay. From this tower, one man controls the Shepard Niles boom hoists and the air-controlled twin-rope rewind-type car retarders, handling two cars coupled together at a time. As the rope attached to the rear car is pulled out, the second rope, after being detached from the front car, is pulled back.

All sizes except remixed 6x0, which is chute loaded, can be dustproofed with 1,000-sec oil, using the Viking system. In addition, a separate calcium-chloride system is installed for freezeproofing all sizes from 2 in down.

Crushing and Rescreening

In the crushing and rescreening plant, also under construction at the time this description was prepared, all sizes from 1½ up received from the ends of the three loading booms handling such sizes can be stage-crushed and screened to 1½x¾, ¾x¼ and ¼x0.

Coal to be crushed is brought in on the top run of the crushing and rescreening conveyor to a 36x48 double-roll McNally-Pittsburg Gearmatic crusher for reduction to 1½ in nominal top size. From the crusher, the coal goes to a 5x16-ft Ripl-Flo vibrator for screening to plus 1½, 1½x¾, ¾x¼ and ¼x0.

The ¼x0 is returned on the bottom run of the conveyor for loading or is sent into the main plant to join the natural ¼ product, while the 1½x¾ and ¾x¼ go to a second Ripl-Flo screen following a second 24x48 Gearmatic crusher. This crusher breaks the plus 1½ from the No. 1 screen, discharging to the top deck of the No. 2 screen.

Plus 1½ over this second screen is recirculated. The 1½x¾ goes to the bottom run of the conveyor for loading. The 3x4x¼ can be mixed with or sent into the main plant to join the natural ¾x¼. As noted, the same procedure can be followed

CHECKING the incoming flow of coal: F. R. Buckley, chief of design and construction, and Cleatis Overton, day washery foreman.

with the ¼x0. Thus, the crushing and rescreening plant can produce 1½x¾, 1½x¼ or 1½x0 for direct loading as crushed and rescreened coal.

Refuse Disposal

Reject at Pleasant View runs 20 to 25% and is derived from bands in the seam, pyrites, top material and fireclay. It is hauled away in Euclid trucks, including a substantial proportion of the extreme fines after dewatering.

The main settling tank, 24 ft in diameter, receives water from all dewatering operations in the plant. The inflow contains all minus 28 from the various dewatering vibrators and the minus 2-mm from the Parrish-type screen following the Hydroseparators. Some 14,000 gpm of overflow is recirculated to the Hydroseparators by two of three 16x14 Allis-Chalmers Type CW pumps. Some 600 gpm of underflow is recirculated by an 8x6 CW pump to the Hydrotators as wetting and push water.

A third 600-gpm fraction taken off near the top of the settling tank by an 8x6 CW unit is pumped to two 14-in Heyl & Patterson cyclone thickeners installed to reduce the quantity of fine coal sent to the settling pond and thus increase pond life. Operating with no back pressure, the cyclones, driven by a 40-hp motor, produce a 10x125-mesh pulp containing 60% coal, which is trucked away along with the coarse refusal for disposal.

The 600 gpm of water containing coal finer than 125 mesh is run to the pond and, aside from moisture on the coal, constitutes the only loss from the plant. Makeup water is added from the pond, a 20,000-gal fresh-water tank, or both.

Plans also were being made to experiment with vacuum filtration of the 10x125 mesh to make a commercial power-plant fuel containing about 20% surface moisture. In addition, the possibility was being considered of adding two manifolds of 3-in cyclones to dewater 125x400-mesh for disposal with the solid refuse, thereby practically closing the water circuit and keeping all but about 15% of the fine coal out of the pond. With the two 14-in cyclones, about 40% of the fines is kept out.

Construction Features

Of modernistic design and painted the standard West Kentucky colors—light yellow or cream with red trim—Pleasant View, when drying and other additions are completed, will be operated with 73 motors totalling approximately 1,800 hp. This includes the 200-hp slope-belt motor, which is operated and maintained by the preparation force.

Motors are primarily Reliance Types O and OAH. Aside from the slope belt, the next largest are three 150-hp units on circulating pumps, 900 rpm, direct-connected. The smallest motors in regular use are 3 hp.

Control equipment includes a console-type control board for operating the plant motors through a Westinghouse control center, including Deion-type starters. A safety switch for repair or maintenance use is installed at or near each motor. Power for motor operation is supplied from a separate transformer room in the plant structure. Power transmission is primarily by Jones reducers and V-belt drives.

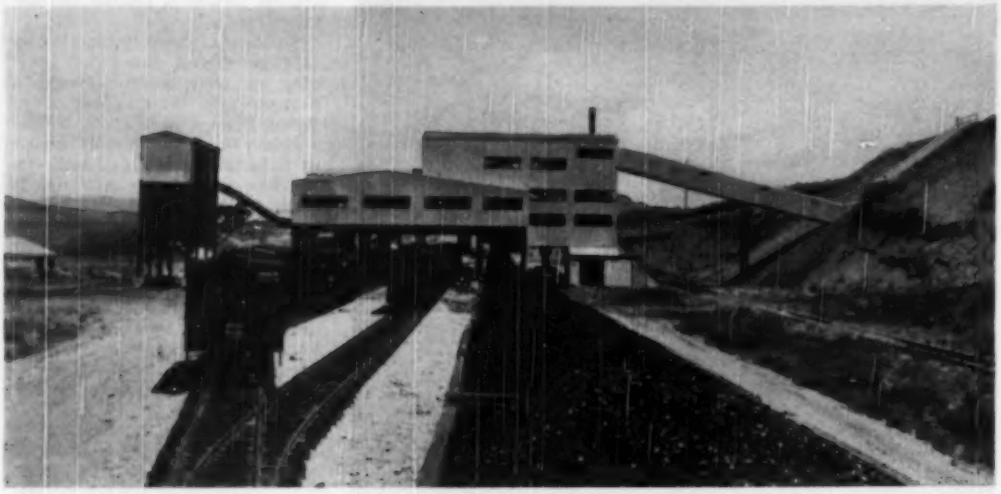
Plant heat, as well as heat and steam for all other surface buildings, is supplied by a 150-hp boiler fired with ¼x0, 10x28 or ¼x28 by Fyr-Feed sprender stokers. Distribution of heat normally is by Modine unit heaters.

Stainless steel (Ludlow-Saylor Rektang and others) is used on all screens, including primary, handling coal ¼ in or smaller in size. Brick linings are used in chutes and sluices as a result of good experience over a period of years in other plants. Experiments also have been carried on with stainless-steel classifier bottoms, with good results; also with glass linings applied with mastic over the regular steel.

In the original glass applications, it was found that the glass sections were too large, leaving too much space over the curved bottom plates at the centers of the glass sections. Consequently, they peeled off. Small sections will be used in the future and are expected to eliminate the difficulty. Among the benefits of glass is a reduction in the time required to wash out a tank after a stoppage. With steel, time required is 40 to 50 min; with glass, never over 9 min.

A clean-up conveyor and a complete laboratory for control and testing purposes round out the Pleasant View preparation facilities. Leading up into the plant from the empty-track side, the belt-conveyor clean-up unit can receive spillage from beneath the plant, in-transit coal from railroad cars and truck coal from various sources, including stripping.

The laboratory on the ground floor of the plant includes float-and-sink equipment for control purposes, necessary splitting and grinding equipment for sample preparation, and facilities for making moisture, ash and sulphur determinations. On the average, a sample is collected from one of the sizes shipped every half hour, in addition to other samples for washing control and size tests.



CONSTRUCTED TO SERVE OSAGE MINE in its new location in Colorado, this new tipple was designed for flexibility and quality preparation. At the left are the custom-coal bins; right, truck-dump hopper 50 ft above tipple ground level.

YARD AND SERVICE FACILITIES include (left) tipple tracks, automatic scale, storage tracks and pile-trestle bridge across Yampa River. A close-up of the scale house with box car approaching is shown at the right.

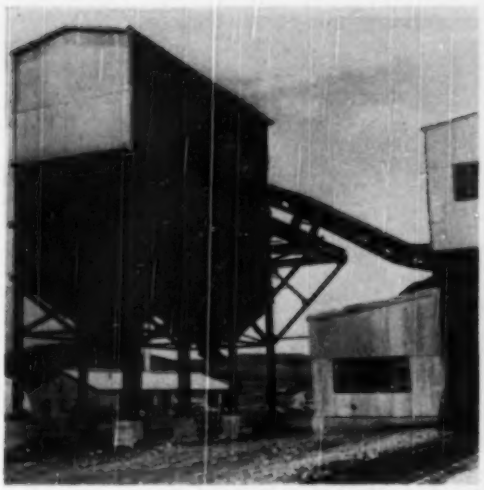
Quality and Efficiency Boosted in . . .

Moving Osage Strip

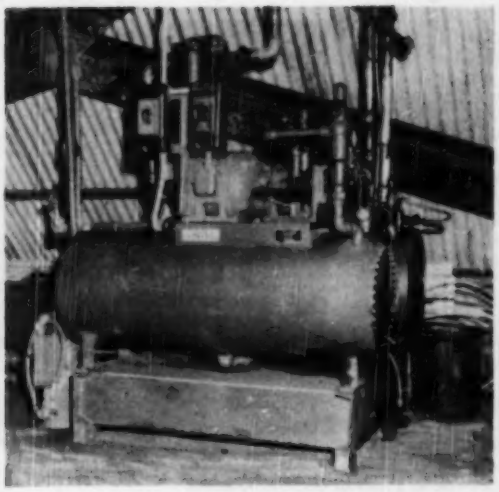
Plant Moved From Illinois to Colorado
Equipment Overhauled for Higher Efficiency
New Plant Built for Quality Preparation

By F. J. FORESMAN, Personnel Director
The Pittsburg & Midway Coal Mining Co., Pittsburg, Kan.

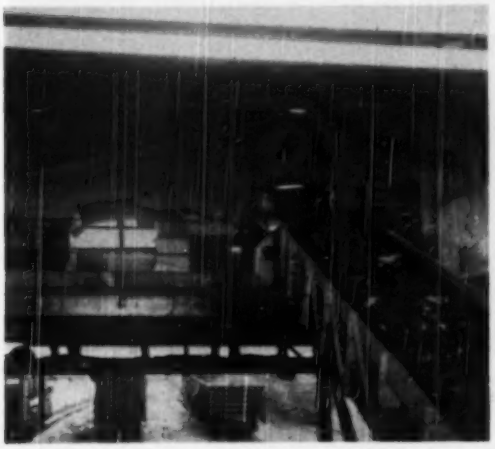
SHIFTING of strip-mining operations from LaSalle County, Illinois, to Routt County, Colorado, represents a sizable job any way it is viewed. Nevertheless, it was efficiently handled with a minimum of lost time by the Osage Coal Co., an affiliate of The Pittsburg & Midway Coal Mining Co., Kansas City, Mo.

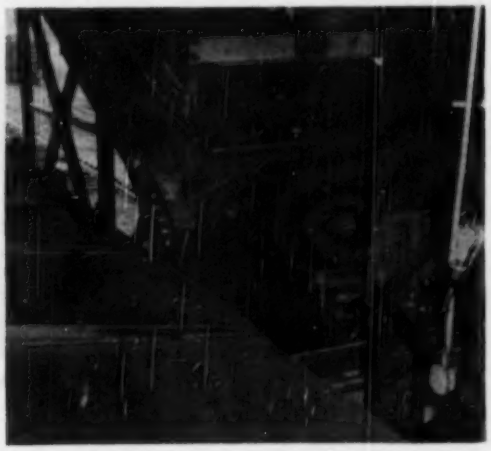


THREE STEEL BINS loaded by swinging conveyor on turntable provide custom-coal storage for all sizes.



ALL SIZES MAY BE DUSTPROOFED by the hot-oil process, using the unit shown in this view.





TURNTABLE MOUNT AT HEAD END OF BOOM (left) makes it possible to swing it over to load open or closed cars—the latter via a shuttle feeder (right). Picking is done on the booms. Doors on the shakers permit mixing of sizes.

Much of the equipment was overhauled in the process and a completely new and modern tipple especially designed for handling the high-quality coal seam was constructed. The flexibility of the new plant, plus the latest and most efficient type of excavating and loading equipment, results in one of the most modern strip mines in the Colorado field.

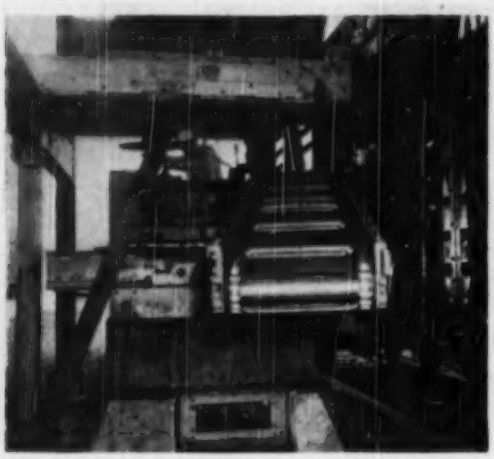
● **Rebuilding and Repair Accompanies Move**—The big job of moving began April 1, 1949, with the dismantling of the 9-W dragline. The machine was shipped to Milner, Colo., and re-erection was started the latter part of May. In rebuilding, all necessary repairs and replacements were made, and the machine was ready for operation Sept. 1.

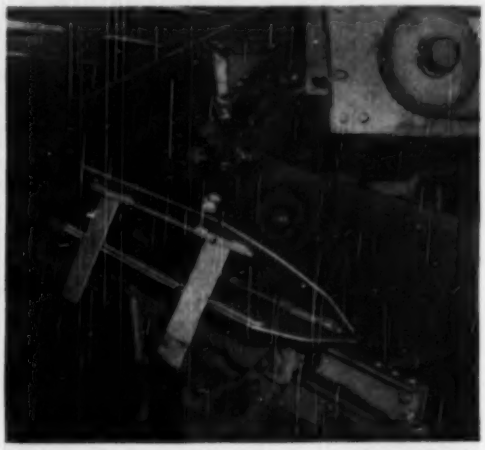
Dismantling of the tipple, at Ottawa, Ill., began April 30, 1949, immediately after the last truck load of coal went over it. All the steel that could be utilized in the new Colorado plant was shipped to the United Iron Works, Pittsburg, Kan., for refabrication.

All electrical equipment, including tipple motors and dragline generator and motors, was shipped to the Pittsburg & Midway electrical department at W. Mineral, Kan. Under the supervision of H. J. Garrison, chief electrician, the equipment was carefully checked and necessary repairs made before being sent on to Colorado. All armatures were treated with insulating varnish and baked and commutators were turned and undercut. New bearings were installed in most of the motors and all motors were cleaned and painted. The switchboard and push-button station also were constructed at W. Mineral.

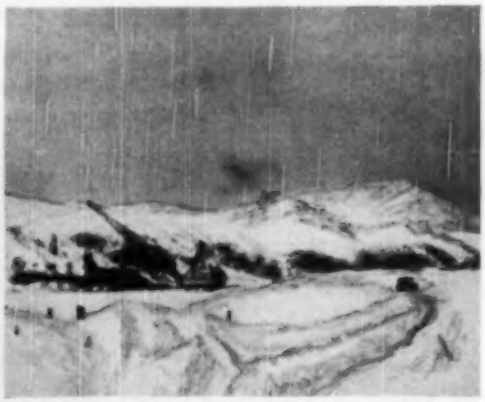
● **Snow Helps Grading**—Although construction of the tipple did not start until June, 1949, much pre-

Osage Geared to High Efficiency Despite Severe Winter Conditions

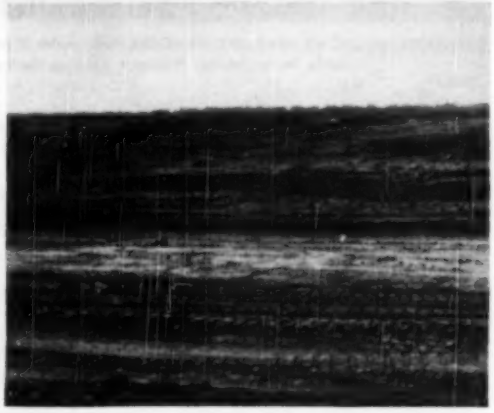




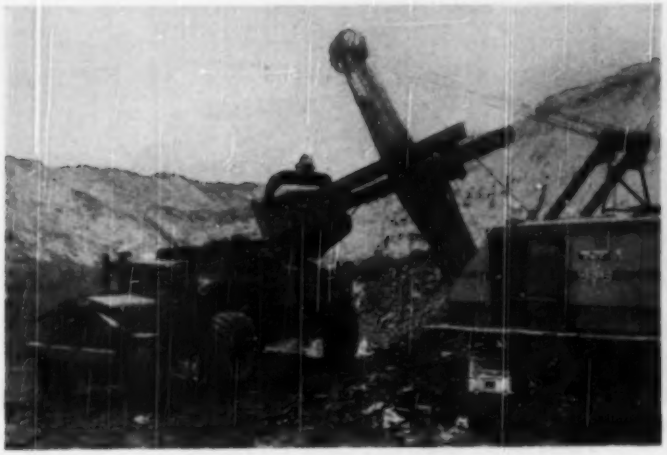
SHUTTLE FEEDER (left) discharging to either track, is shown in closed car and will be followed by box-car loader. At the right, the box-car loader is shown in position in the car and receiving coal from the shuttle feeder.



OSAGE PIT in summer and winter. Stripping is done with a dragline equipped with a 160-ft boom and 10-cu yd bucket. The seam pitches 10 deg and is overlaid with 55 to 60 ft of overburden, which is drilled and shot with horizontal drilling equipment.



TWO 12-CU YD SCRAPERS assist the dragline at Osage in moving material that cannot be reached by the dragline and in establishing level footing for the unit in the mountain area where the property is in operation.



AFTER BULLDOZER AND HAND CLEANING, coal is loaded by a 3½-cu yd shovel. Shooting with pellet powder breaks coal for loading.

WIDE, WELL-MAINTAINED ROADS, downgrade to the tipple, provide a good highway and safe passing for the 20-ton semi-trailers.

liminary work had been completed previously. The connecting track with the D. & R. G. W. R. R., about 1 mi in length, including a 294-ft pile-trestle bridge across the Yampa River, was installed during the winter of 1948-49. All the grading for load, empty and tipple tracks also was completed. At times during the winter the snow was as much as 4 ft deep and the temperature as low as 38 below zero. The work, nevertheless, was completed with the loss of only two days work.

The snow actually was a help in the grading as it protected the ground from freezing. Including the yard, 4 mi of track was built to service the tipple. The empty and load tracks have a capacity of 50 cars each, and the tipple storage tracks a capacity of 40 cars. The tracks were built on a slightly steeper grade than is normally used to facilitate movement of cars by gravity during the severe winters.

How Osage Prepares A Quality Product

Actual construction of the tipple began June 15 with the excavation for the 75-ton concrete receiving hopper. Designed to fit the lay of the land, the tipple site was projected so that the hopper was located on an adjacent hill, with the runway 50 ft above the ground level of the tipple. Such an arrangement made it possible to install both the primary and secondary crushing units below the hopper, resulting in the saving of a considerable quantity of steel that would have been required for additional structure height had the secondary crusher been installed in the tipple in the conventional manner.

An unusual feature of the construction was that material removed during the excavation for the empty tracks and receiving hopper helped defray construction costs. The 50- to 60-ft cut made for the empty track grade was through a 15- to 16-ft vein of Wolf Creek coal, which was loaded and crushed by a portable hopper-crusher unit and sold for steam coal. Gravel-size rock removed from the hopper excavation was utilized as aggregate for most of the concrete poured.

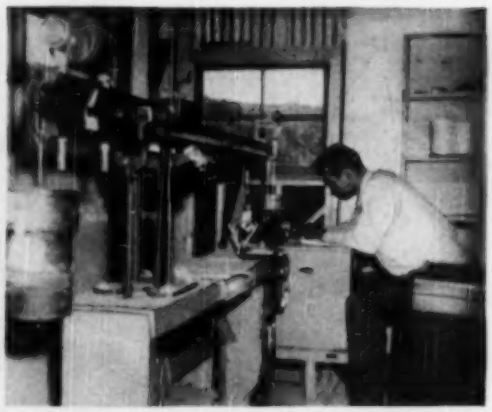
Construction of the tipple was completed Oct. 8 and the first coal was run through on a production basis Oct. 15. Edwin R. Phelps, a member of the Pittsburg & Midway engineering staff, headed by C. F. Irwin, chief engineer, had direct supervision over all construction work, including grading and tipple erection.

• **Tipple Features Promote Efficient Operation**—The plant was designed by Elmer H. Citron, mechanical engineer, Pittsburg & Midway, and was built by the United Iron Works. Designed for flexibility, the tipple has a capacity of 400 tph and features primary and secondary crushing below the receiving hopper; an especially designed mechanical shuttle conveyor for fast, efficient loading of closed cars; and three steel truck bins for handling custom coal. Any-size coal may be conveyed to the bins to meet the requirements of the local trade. Five tracks serve the tipple and coal may be loaded into closed cars on three. Provision also has been made for oil treatment of all sizes.

Coal from the 75-ton receiving hopper is fed by a 5x10-ft McNally-Pittsburg reciprocating feeder into a 24x48-in McNally-Pittsburg double-roll crusher set to break the coal to minus 16 in. The feeder motor is equipped with a Reeves vari-speed control which permits the tipple operator to adjust the feed tonnage by remote control. Discharge from the crusher passes over a 6-ft two-section scalping screen equipped with a 3-in round plate on the first section and an 8-in veiled screen on the second section. A United Iron Works 30x54 single-roll crusher is located below the scalping screen. All coal may be crushed to minus 3 in, or all coal may be by-passed to the run-of-mine conveyor.

The 42-in run-of-mine belt con-

Quality Preparation Keyed to Modern Stripping Equipment at Osage



MINE OFFICE BUILDING (left) contains quarters for supervisory and engineering personnel and custom-coal scale (right) and is heated with a forced hot-water system.

OSAGE OPERATING MEN—Emery J. Carlson (left), assistant secretary and office manager; Harry E. White, tipple superintendent; and Frank E. Barrett, pit superintendent.

veyor, operating at a speed of 275 fpm, conveys the coal to the primary shaker in the top of the tipple where the various sizing and recrushing processes begin.

● **Shaker Design Reduces Stress and Promotes Flexibility**—The primary shaker is designed in four sections, with the top and lower two driven independently as units. This arrangement reduces stresses in the tipple. Another feature is the 1⅝-in ash-wood hangers, which increase efficiency. Since the two-section units may be driven separately, only the top unit is operated when all the coal is crushed to minus 3 in.

The larger coal, from 16 down to 1¼ in, is fed by the shaker to the loading booms. Turntables to which the head ends of the booms are attached enable the booms to be used for loading both open-top and closed cars. Through a system of doors in the shaker a large variety of sizes may be produced.

The smaller coal, 3-in minus, is discharged by the shaker to a 6x16 double-deck Robins Gyrex vibrating screen equipped with a 1¼-in screen on the top deck and a ⅜-in screen on the bottom. Coal passing over the 1¼-in screen is fed to a 24x48 McNally-Pittsburg stoker crusher. The crusher discharge is rescreened on a 6x10 Gyrex screen. The oversize is returned to the primary shaker via a closed circuit consisting of a rescreen conveyor and bucket elevator. If desired, the entire feed tonnage may be used for the production of stoker coal.

● **Oil-Treating Rounds Out Preparation Cycle**—The latest Viking equipment is used for oil-treating the coal. All sizes may be treated. The oil-storage tank is located in an insulated building adjacent to the tipple and is heated during the winter months to maintain the oil at the proper viscosity so that it will flow by gravity to the oil-treatment equipment, where it is heated and pumped under pressure to the loading booms. A steam boiler provides heat for attaining the viscosity required for atomization under pressure. The plant also is used as part of the tipple-heating system.

The steel custom-coal bins are filled by a 36-in custom-coal conveyor running the length of the tipple. Stoker coal and smaller sizes are carried to the custom conveyor by a 30-in belt, and the larger sizes are discharged from raised loading booms attached to a turntable. A 2-ton motor-driven trolley-type hoist moves the loading boom across the tops of the bins, which may be filled with any size of coal.

● **Shuttle Feeder Serves Box-Car Loaders**—Completely mechanized box-car loaders, consisting of one stationary and two Model M.D.L. Ottumwa loaders, are used to place coal in closed cars on three of the five tipple tracks. The tracks are on 21-ft centers, and both closed and open-top cars may be loaded on them. A special feature of the loaders is a mechanized shuttle feeder that reduces time loss in loading closed cars to less than 20%.

The feeder—only one of its kind in operation—was designed by Mr. Citron. It consists of a sprocket-driven apron conveyor mounted on rollers that move along a channel with stops at both ends. The turning effort required to shuttle the conveyor is less than the effort required to turn the apron, making possible instant mechanical shuttling of the feeder in and out of closed cars. The feeder is controlled by a reversing-switch button mounted on the control desk.

To prevent damage to the feeder when a large lump of coal becomes

OSAGE MANAGEMENT OFFICIALS—J. F. Lake (left), vice president and general manager; and G. E. Ralston, superintendent.

lodged between it and the top of the car doors, the heavy ⅜-in flights are made oval and smooth on top so the feeder will keep on turning under the load. The feeder is suspended at three points so that the loading boom, mounted on a turntable, can be moved over for loading open-top cars.

● **Shuttling Time Low**—The time required to shuttle the feeder in or out of a car is only a matter of seconds. Since the box-car loader is moving into the car at the same time, the feeder time lost is almost zero.

As an additional feature, when coal of the same size is being loaded on two tracks, a car may be spotted on one track while the car on the other track is being loaded. As soon as the one car is loaded, the feeder may be shuttled across to the opposite box car and loading resumed immediately.

Loaded cars are weighed automatically as they pass over a Fairbanks-Morse two-draft scale equipped with a Streeter-Amet automatic attachment. All cars are handled by gravity from the empty to the loaded storage tracks.

Power for the operation of the tipple is obtained from the Colorado Utilities Co. plant adjacent to the company's property. Electricity is brought in at 2,300 v to the primary side of the company's own transformer station.

Haulage units and miscellaneous trucks and tractors are housed in a combination shop and garage 50x120 ft. Maintenance work on trucks, tractors and other equipment, including welding and machine work, is handled in the shop. Other buildings include a 40x80-ft storeroom and a modern 30x30-ft office. Scales for weighing truck custom coal are located at the office.

How Osage Handles The Stripping Angle

Production comes from the Wadge seam averaging 8 ft in thickness. The seam lies on a 10-deg pitch and the depth of the overburden averages 55 to 60 ft.

Stripping is done with a Monighan 9-W diesel dragline augmented by two 12-cu yd Model 80 Caterpillar scrapers pulled by D8 tractors. The dragline engine is a Fairbanks-Morse diesel, and the machine is equipped with a 160-ft boom and 10-cu yd bucket. The scrapers are used to remove overburden that is out of reach of the dragline and to provide level footing for the dragline in the mountainous terrain. The scrapers carry away overburden that could not be disposed of by the dragline.

The overburden is drilled horizontally with a 6-in McCarthy horizontal unit on 20- to 30-ft centers, depending upon the thickness of the overburden. Stripex No. 6 explosive, manufactured by the Illinois Powder Co., is used for shooting. Average loading, which is still more or less experimental, is 0.20 lb of explosive per cubic yard of rock.

Drainage does not present much of a problem except in low places in the pit and during the spring when the snow melts. In general, drainage is natural and very little pumping is required.

● **Haulage Grade Favors Loads**—Coal is loaded with a 54-B Bucyrus-Erie shovel equipped with a 3½-cu yd coal-loading bucket. A bulldozer cleans the exposed coal surface and, when necessary, is supplemented by hand cleaning. Pellet powder is used to break the coal for loading. Three 20-ton Euclid semi-trailer units are used for coal haulage to the tipple receiving hopper, which is at a lower elevation than the pit, resulting in a slight down-grade road in favor of the loads. The main haulage road is wide for safe passing and is well maintained.

The official and supervisory staffs of the Osage Coal Co. are made up of men with many years of experience in strip mining. Company officers are: K. A. Spencer, president; Joe F. Lake, vice president and general manager; George E. Nettels, vice president and director; H. H. Spencer, director; John P. Miller, secretary; Henry J. Hofmeister, treasurer and assistant secretary; and E. J. Carlson, assistant secretary. Mr. Lake is in direct charge of the operation.

The supervisory staff, in addition to Mr. Lake, consists of G. E. Ralston, mine superintendent; Frank E. Barrett, pit superintendent; and Harry E. White, tipple superintendent.

All coal produced at the mine is sold through the Western Div. sales office of The Pittsburg & Midway Coal Mining Co., located in the Security Life Building, Denver, Colo. The office is under the supervision of W. G. Joyce, western manager, who is assisted by John F. Ferguson. Both men have had many years of experience with sales in the coal industry.

● **Altitude Problems Solved**—The mine is 11 mi west of Steamboat Springs, Colo., a popular winter and summer resort town, at an elevation of 7,000 ft on the western slope of Continental Divide. The annual snowfall in the area exceeds 200 in and the temperature drops as low as 38 below zero. At such an altitude, engines operate at approximately 80% efficiency, and snowfall during the winter months is a daily occurrence.

Such conditions introduce production problems not encountered in other fields. However, the problems have been solved with larger capacity engines; regular and persistent use of bulldozers and road grader to keep the haulage roads open; and a midnight crew that cleans the tipple tracks and prepares the plant for operation. Last winter, the first of operation, the coal was kept steadily moving from the pit to the tipple without loss of production in spite of the severe winter.

BUILDING GOODWILL IN NEW ENGLAND—John F. Sellar (left), New England Coal & Coke Co., in action before the Everett (Mass.) Rotary Club, June 22, 1950. At the right, a point is made by the author. A member of an Ohio coal family and a law graduate, Mr. Johnson's career has included a term as vice president of the Lorain Coal & Dock Co., and, since, 1925, association with a number of New England retail and wholesale organizations, and wartime service as principal price executive for the area's OPA Solid Fuels Branch.

Speaking of Coal

How New England Goes About the Job
How Coal Benefits in Goodwill

By J. L. JOHNSON

President, New England Fuel Dealers' Association, Boston, Mass.

THE AMERICAN PUBLIC, until recently, has been prevented from obtaining a clear view of the coal industry because the true picture has been obscured by the imposing figure of John L. Lewis. I use "imposing" advisedly because there has been a definite imposition upon the people of this country. Except for an occasional statement to the press by an operator engaged in negotiations, the matter of disseminating information on coal mining was left almost entirely to this vociferous labor leader.

As a result, highly distorted ideas were projected to the general public, with the operators depicted as ruthless exploiters of a great natural resource and heartless oppressors of unfortunate coal miners. The man in the street was likely to think of Centralia as the rule rather than the rare exception, and he was led to believe that miners were forced to work long hours in poorly ventilated caverns while their families were scarcely able to exist on sub-standard wages.

Under such conditions, how was anyone outside the actual coal fields to know that the miner is the world's highest-paid industrial worker? Or that, through expenditures of millions of dollars on research, development and new equipment, coal producers have succeeded in reducing the frequency of accidents one-half in a period of 20 yr? Or that 80% of the coal-mining families in the United States live in their own homes or in houses rented from independent owners?

● **Getting Through the Curtain**—Of late the coal industry has been bringing these facts to the public's attention, and one of the most effective media has been the Speakers' Bureau of the Bituminous Coal Institute. As New England liaison representative for the institute in this important function, I have been able to observe the program since its inauguration and thus can offer an over-all appraisal of its effectiveness.

First, however, I should like to point out that the six New England states which we represent are hundreds of miles from the nearest coal mines. Thus, the people of this area—deprived of first-hand knowledge of conditions—might well be expected to accept the propaganda that emanates from the headquarters of Mr. Lewis and which for a long time was permitted to go out without contradiction.

Our people are consumers of coal. They see it transported over our railroads, loaded into ships' bunkers and delivered to homes by truck. They use it in their homes for heat and in their factories for power. However, they have not been interested in its origin or in the folks who produce it, except as their emotions were affected by stories about mining people. Our speakers' bureau has set out to get them interested in the complete background and to refute with facts the erroneous opinions that have been formed as a result of unfair criticism of the industry.

• **Organizing for Results**—Our program was launched 3 yr ago when Dr. M. Edmund Speare, educational director of BCI, came to Boston and invited operators and distributors in this region to bring our story on coal direct to New England's thought leaders, business men, housewives and students. Once our local organization was set up, BCI circularized various groups in this part of the country with the announcement that speakers were available for mutually convenient dates. A variety of timely subjects —all based on activities and accomplishments of the coal industry— were offered.

When an assignment was requested, we selected a member of our bureau in geographic proximity to the place where the speech was to be delivered and asked him to fill the engagement. For his assistance the institute provided sample speeches and pertinent material on his state or district. Sometimes the speaker followed the script without change, but in most cases —particularly in the more recent stages of our project—there has been improvisation to fit the occasion.

BCI also has made available the film, "The Magic of Coal," with which most of our speakers like to supplement their talks. This film has received particularly gratifying reception throughout New England, since it portrays mining operations that are obviously unique to audiences so far removed from coal-producing areas.

• **Three Years of Operation**—In the first 3 yr of our New England program well over 200 speeches were delivered to civic groups, veterans' organizations, church and fraternal groups, and schools. As a result, we have brought our story to 8,720 interested listeners, and week after week we are adding to this number in all six of our states. After each talk the speaker supplies the community newspaper with a release covering the highlights of the speech, and very broad coverage has been achieved.

The speeches tell the whole story. We don't preach. Rather we provide a brief "education" for those who know nothing about our industry. We're coal men, not medicine men, and we merely present the facts without attempting to prescribe ways of curing the nation's industrial and economic ills. We speak with authority when we cite our production and consumption figures to prove that the bituminous coal industry is healthy and vigorous and can be depended upon to furnish America with heat and power in time of peace or war.

• **Facts for Ammunition**—We have all the necessary data to show that operators are not the heartless industrialists that John L. Lewis would have you believe. They are progressive businessmen with a deep interest in the safety and welfare of their employees. Mining communities today are made up of attractive homes, with all the conveniences available in other communities. Miners' children attend up-to-date schools and have playgrounds, swimming pools, boys' clubs, summer camps and other recreational facilities, many of which are comparable to those in the majority of America's small towns.

We explain that the company store at the mining town is a modern market offering customers a wide choice of high-grade merchandise at competitive prices, and that, therefore, most families prefer to do their buying there, despite the fact that they may jump into their cars and shop at the neighboring supermarket or independent shop.

We point out that mining is no longer a pick-and-shovel industry, but, on the contrary, is so highly mechanized that 90% of all the coal produced in this country is cut by machines. Modern transportation systems, which include streamlined trains and long conveyor belts, have made the horse and the mule rarities in today's mines.

• **Selling the Industry Sells Coal** —The message we bring to our audience is built around these facts. We also discuss distribution methods, and we explain the advantages of coal heat and power over competitive fuels, but in no way do we attempt to write orders for the companies we represent. Ours is a selling job, but solely to sell the facts about coal to the folks of New England the same way you and I want to sell the true story of American free enterprise to the men and women of this country and the world over.

There is no denying, of course, that in the process of winning goodwill for the coal industry the speaker simultaneously gains friends for the company he represents. His business experience and company connection are always mentioned in the introduction, and resultant news stories and editorials provide a further boost.

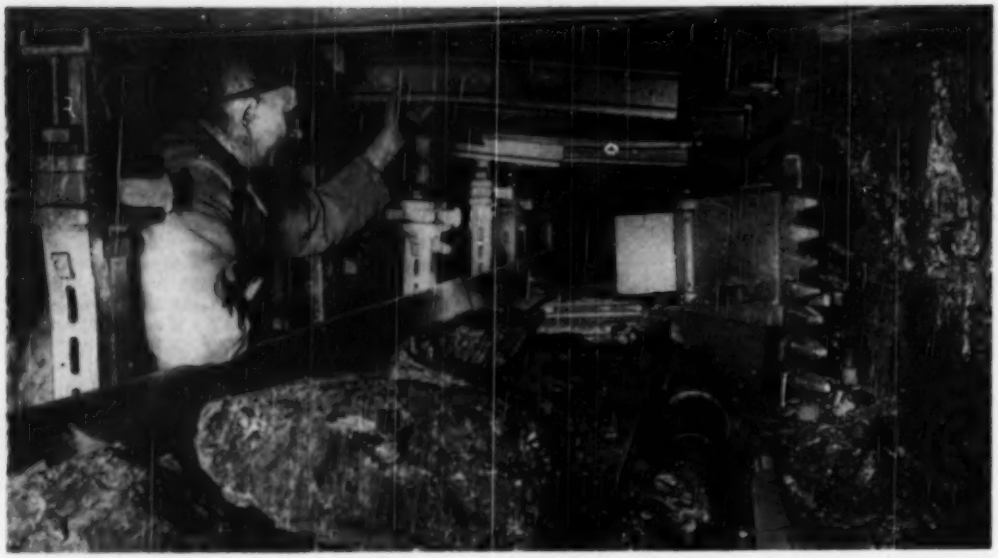
From an advertising standpoint, it would cost the company a great deal more to reach such an enthusiastic audience if conventional approaches were utilized. We appreciate these advantages, yet our objective is a public-relations job for the coal industry, and we usually bend over backwards to avoid giving the impression that our motive is a selfish one.

• **Problems and Solutions**—Our work, we believe, is paying big dividends in goodwill. Nevertheless, the job has not always been as easy as it may sound. The biggest problem is one no doubt peculiar to non-coal producing areas: the shortage of speakers to meet the week-to-week requests. While the areas where coal is mined are well staffed with executives from operating companies, as well as from sales and distributing organizations, our roster naturally is limited.

If, for instance, we should receive requests for speakers at two service-club meetings, to be held at noon on the same day in adjoining towns far out in a rural region, we are confronted with the task of drafting a speaker from a city many miles away to supplement our "staff" of a lone representative in the district where the address is to be made. One answer, of course, is to ask for a postponement on the part of one of the clubs, yet we hesitate to suggest such a delay after the invitation has been extended and tentative plans made.

However, that solution is an apologetic excuse and one that need not be resorted to in this area of industry-spirited coal men. Eventually, I believe, we shall have more speakers, but only when our representatives realize that our work does not demand orators or Dale Carnegie graduates. Few of us are experienced speakers, yet the letters which have come to me from the clubs that have heard our story indicate that the audiences are more than satisfied with our non-professional platform contributions.

• **Better Understanding the Goal** —Our experience in New England has been that the people want to know more about what to them is a very interesting and intriguing subject. We have no difficulty at all in getting opportunities to tell our story, and as we succeed in obtaining more speakers to join us in this important work we shall gradually bring to most of our citizens the information that will provide a better understanding of the industry.



NEW-TYPE COAL PLANER mining hard 42-in seam at Friedrich Heinrich colliery; output, January, 1950, 11.5 tons per face worker.

Equipment, Methods and Results in . . .

Planer Mining

EQUIPMENT—New-Type Planer Provides Increased Efficiency and Can Be Used in Hard Coal

METHODS—Continuous Mining of Longwall Faces 150 to 800 Ft Long, in Coal 2 to 7 Ft Thick

RESULTS—Generally, 10 to 15 Tons per Face Worker; at Friedrich Heinrich Colliery, January, 1950, 11.5 TPM in 42-In Coal

By E. ANDERHEGGEN
Mine Director, Mine Friedrich Heinrich, Kamp-Lintfort, Germany

THE EXTRAORDINARY coal shortage during the war and in the first postwar years has resulted in mining engineers in every coal-producing country of Europe developing new mining machines for increasing both output per man and per shift. The most important of these machines have been described in "Mining Machinery Abroad" (*Coal Age*, December, 1949). In this article reference was made to the coal planer, or "Hobel," invented by a German mining engineer in 1942, and which, in various modifications, has been put into operation and demonstrated in almost every European coal field.

In the last 4 yr, after the major postwar difficulties had been overcome in the German coal-mining and mining-machinery industries, this planer became the subject of considerable further development by the late Wilhelm Loebbe, well-known chief designer of G. E. Westfalia, Luenen (Westphalia), in collaboration with mining engineers of the Ruhr and Saar coal fields. The result is the new coal planer, "Loebbe Hobel," (Fig. 1), a continuous coal-getting machine for longwall mining of seams 2 to 7 ft thick. The machine is capable of producing, loading and delivering to a mother belt 1.5 to 5.0 tons per minute, i.e., 500 to 1,500 tons per shift.

● **Development Goals**—It is interesting to note that continuous mining machines were developed simultaneously both in Europe and in the U. S. A. in spite of differing mining practice—longwall and room-and-pillar, respectively—although there was a difference in the reason. In the United States, mine management strove for more efficient mining machines to reduce labor costs, which are high compared with machine costs.

In Europe, also, reduction of labor costs by increasing tons per man, which had been critically reduced by war, is an important factor. However, to lower the operating costs of mechanical equipment by raising the production rate per shift is equally important, since costs of machines and materials are very high compared to labor costs. In long-walling, these requirements are best met by the Loebbe Hobel coal planer because, with a high production per man and per shift under the seam conditions in Ger-

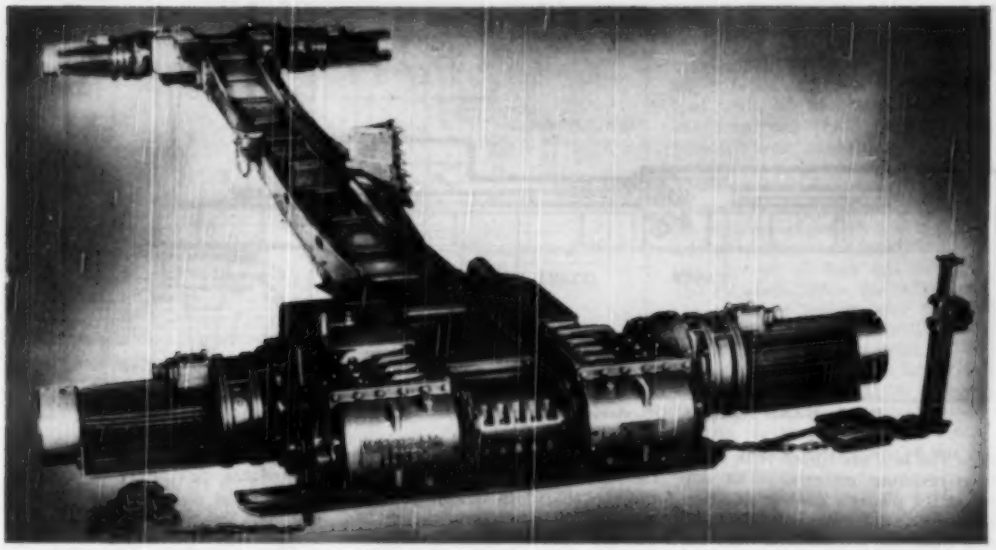


FIG. 1—GENERAL ARRANGEMENT of new-type planer, with double-chain conveyor and multiple motors at each end.

many, this machine combines the maximum productive capacity per working shift.

Since the features and advantages of the longwall system have already been discussed (see, for example, "Methods for Future Mining," in the March, 1949, *Coal Age*), it is perhaps enough to say that the Loebbe Hobel planer is suitable for continuous production in thin seams (24 to 42 in) where other continuous machines cannot as yet be employed. The following deals with the mechanical construction of the latest model planer, which has been developed at Friedrich Heinrich colliery, in the Ruhr, with essential preparatory work at the Kohlwald colliery, in the Saar. It deals further with the layout and roof control of planer panels, and with the results obtained in a 42-in seam at Friedrich Heinrich.

How the Planer Operates

The principle of the planer is stripping or planing layers of coal up to 12 in thick off the solid coal face in a longwall panel. Planing is accomplished by pulling a vertical cutting element along the face. The coal produced is then turned, or "ploughed," onto a double-chain conveyor, which serves as a face conveyor and as guide and slide bar for the planer and the wedge-shaped planer body (Fig. 3). The planer itself is composed of two symmetrical halves, each of which is fitted with a cutting edge. Thus the planer can strip coal in both directions and load to the conveyor.

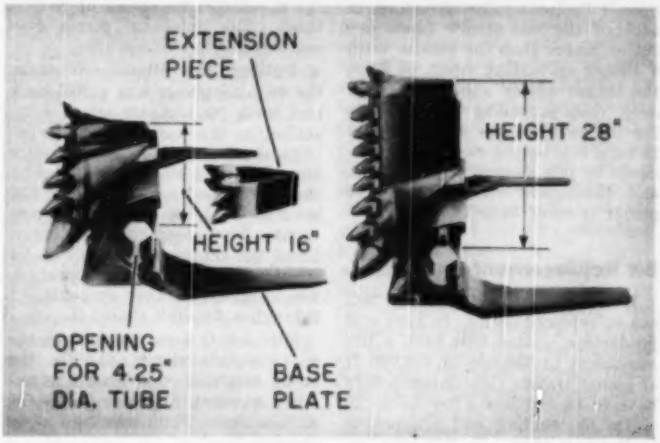


FIG. 2—PLANER TYPES for high and low coal.

The height of the planer normally is one-half to two-thirds of the seam thickness. Top coal is expected to break down by its own weight and drop into the conveyor after being undercut. In all seams where this condition exists, the coal is produced and loaded by the planer without any other preparation, such as cutting and shooting. As the original-type planer usually strips coal to a depth of 8 to 12 in, it can mine only rather soft coal if excessive pulling force is to be avoided.

● **Stripping Depth**—The main factor adapting the Loebbe Hobel planer to use in relatively hard coal is its ability to strip coal layers only 2 to 6 in thick. The exact stripping depth can be adjusted to the hardness of the coal by guide plates at the planer base. In spite of the limited stripping depth, the output obtained with the new-model Loebbe Hobel planer is no less than that of the original type because its cutting speed has been quadrupled to 75 fpm.

In the Loebbe Hobel, the two stripping blades of the original type are replaced by bits with cutting edges on the sides (Fig. 2), thus making possible stripping of hard coal without cutting or blast-

How the German Coal Planer Is Utilized for High Output in Thin Seams

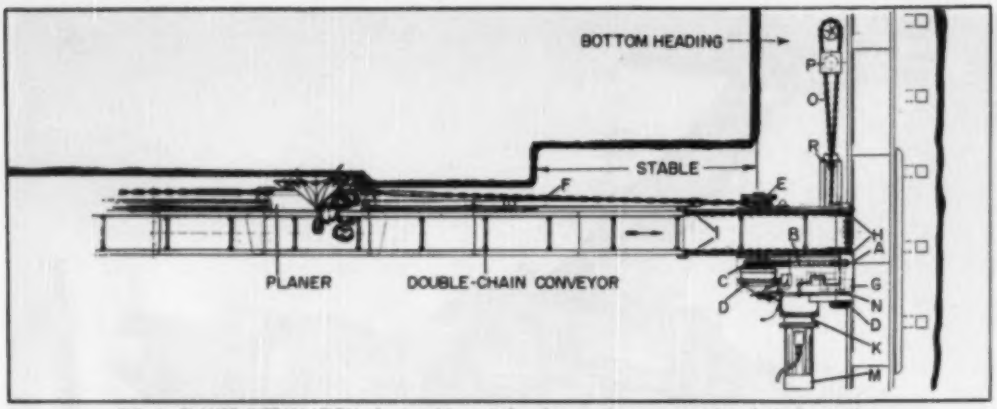


FIG. 3—PLANER INSTALLATION, showing drive unit for planer and conveyor, and method of operation.

ing. The bits are tipped with hard, wear-resisting material. The one bit at the planer's base, in addition to the vertical edge attacking the coal face, has a horizontal edge for cutting the planer track.

Experience in hard coal has proved the advantage of having, in each of the two planer faces, one cutter longer than the others. With a slicing or cutting depth of 3 in, the longer cutter should cut 6 in deep, thus preparing the coal face for the next passage of the planer. In hard coal seams, resistance is relieved by this method of precutting, and subsequent stripping by the planer is made easier.

Bit Replacement

With Morse-taper shanks, bits can be replaced easily. In hard-coal production, cutter tips have a life equivalent to 300,000 to 450,000 ft of planer travel. Consequently they have to be renewed after 15 to 20 shifts by welding and sharpening in the tool room. In this way operating costs have been reduced to a minimum and interruptions usually suffered with cutter-loaders because of replacement of bits during a working shift are avoided.

As the new planer is very narrow, its base is widened by two steel plates below the double-chain conveyor, with the result that the planer is prevented from tilting by the conveyor weight. During planer travel along the face, the double-chain conveyor is lifted slightly by the planer's base, which results in some extra power for pulling. This drawback is offset, however, by easier shifting of the conveyor toward the coal face.

A 16-in-high planer for 18- to 36-in seams is shown in Fig. 2. Another planer shown is suitable for thicker seams or seams where the top coal does not drop of its own weight after the planer has passed. This type is basically the same except for its height, which is increased by extension pieces, making it suitable for seams up to 7 ft thick. The extension pieces also are fitted with cutting bits.

• **Pulling the Planer**—Whereas the original planer was pulled back and forth by separate winches installed in the top and bottom entries, the new unit does not require any winches at all, as it is pulled by the driving units of the upper and lower ends of the double-chain conveyor. The speed-reduction gear, *G*, of the conveyor drive (Fig. 3) is equipped with a gear sprocket, *A*, which drives another sprocket, *C*, through a flat-link chain, *B*.

Sprocket *C* is connected with the multiple-plate clutch, *O*. On the outby shaft of this clutch is another sprocket, *E*, which drives the endless chain, *F*, in turn laid along the coal face and pulling the planer back and forth. Sprocket *E* is equipped with a safety shear-pin coupling for a maximum load of 20 tons. The coupling safeguards the planer chain against breakage if the multiple-plate clutch should not slip at the maximum load. The power-intake portion of the multiple-plate clutch, *D*, runs continuously during conveyor operation, while the outgoing side of Clutch *D*, together with Sprocket *E* for the planer chain, move only when the clutch is engaged. The clutch is operated either pneumatically or hydraulically with electric control.

A drive of this kind (Fig. 3) is installed at each end of the double-chain conveyor. Once the clutch at the delivery end of the conveyor is engaged, the planer will be pulled toward the delivery end; engagement of the clutch at the opposite end pulls the planer back.

• **Planer Control**—An operator in the heading at the delivery end of the conveyor controls the planer through the two clutches. He can start and stop the conveyor and make the planer run out or back by pressing buttons. Fig. 4 shows diagrammatically the electrical control of the planer and the remote control of the motors. All electrical equipment is flameproof, in accordance with Ruhr safety regulations.

In planer control, the operator responds to visual signals from the face transmitted via the lighting system. From his station he also can return visual signals to face workers, maintenance men and supervisors if there is a delay.

Since, from his station, the operator cannot determine the exact moment at which the planer arrives at the other end of the face, it is stopped automatically. The stops use nuts attached to the planer chain about 4 ft from the planer cutting tool in both directions. When these nuts run over the planer chain sprocket they move a lever which disengages the clutch. After the planer has been stopped automatically, the operator can restart it in the opposite direction.

With this type of drive the planer is pulled up, or out, by the drive at the upper end of the double-chain conveyor, and pulled in, or downward, by the drive at the lower end. As the two drives are coupled by the conveyor chain, one drive can take over part of the load of the other if it becomes overloaded.

• **Endless Chain Pulls Planer**—The endless chain pulling the planer

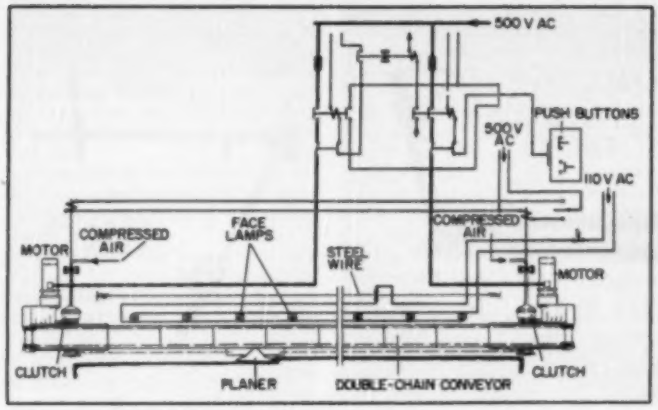


FIG. 4—WIRING DIAGRAM for planer and conveyor drives.

across the coal face is 0.87 in in size. Its breaking strength is 50 tons. To facilitate moving, the chain is subdivided into 26-ft lengths joined by chain couplings. The two ends of the chain are connected to the planer by turnbuckles, which also serve for stretching the chain. Attached to the double-chain conveyor is a 4.25-in-dia tube through which the returning portion of the chain runs. Thus, the returning chain is never strained no matter which way the planer travels. The planer itself includes an opening (Fig. 2) fitting over the tube.

The multiple-plate clutch for starting and stopping the planer and the safety coupling inside the sprocket (*E*, Fig. 3) are designed for a maximum chain pull of 20 tons. As the chain-breaking strength is 50 tons, limiting the load to 20 tons provides a sufficient safety factor against chain deformation or destruction. A feature of the multiple-plate clutch is its smooth engaging action.

• **Pulling Forces and Power**—Pulling forces on the planer range from 3 to 20 tons, depending on coal hardness and depth of cut. With pulls of over 20 tons, the pins in the safety coupling will shear off. If such excessive pulling forces occur, the cutting depth of the planer should be reduced.

Oscillograph tests have been made at Friedrich Heinrich colliery to ascertain the actual power consumption of the planer—as a necessity in choosing conveyor motors of the proper rating. It has been determined that in a 42-in seam of relatively hard coal, with a slice of 4 in, a maximum of 30 hp is necessary to pull the planer.

The Planer Conveyor

A special double-chain conveyor ("Panzerfoerderer") for planer work has been developed by the firm Eisenhuette Westfalia, Luenen. This conveyor can be extended to 1,000 ft, and thus is suitable for any face length in European coal mining. The conveyor is composed of 5-ft long troughs fabricated by welding two special-section channels to a plate 0.4 in thick and 20 in wide. The troughs are connected by flexible-bolt joints that enable adjoining troughs to move out of alignment with each other by 4 to 5 deg, both vertically and horizontally. The resulting conveyor flexibility facilitates shifting after the planer has passed. The troughs are sufficiently strong to withstand the impact of falling top coal in thick seams without deformation.

The endless conveyor that runs through these troughs is composed of two chains 0.7 in in size and 20 in apart. Both chains are connected by scraper flights spaced 40 in apart. The chain links have a 2.5-in pitch and are made by electric welding. It took years of research to improve the chains to the present standard of strength. The latest type will not break even in long conveyors driven by high-powered motors. Present chain-breaking strength is actually 28 tons; the permissible operating load is 18 tons. Consequently, each chain can withstand the full driving load as when the conveyor is curved in shifting.

• **Conveyor Power Requirements**—Double-chain conveyors of this type demand high driving power which preferably should be provided by multiple motors installed at both the upper and the discharge ends (Fig. 1). The discharge-end motors pull the chain through the upper troughing, together with the load, while the back-end motors pull the returning chain through the inverted lower troughing.

According to careful tests at Friedrich Heinrich, the power need of the double-chain conveyor is 0.1 hp per foot of length and per 100 tph of production. Accordingly, a conveyor 600 ft long and handling 150 tph needs 90 hp. Actually, since the conveyor motors also provide the pulling force for the planer, motors totalling 120 hp must be installed, e.g., two motors at 60 hp each or four motors at 30 hp each (Fig. 1). Under unfavorable conditions, as in pulling up the dip, power requirement may be up to 50% higher.

The motors at both ends of the conveyor (Fig. 3) drive sprockets, *H*, for the twin conveyor chain, *I*, through a reduction gear, *G*. An automatic fluid coupling, *K*, installed between motor, *M*, and reduction, *G*, insures smooth starting acceleration of the chain and cooperation of the motors at both conveyor ends. In addition, by transmitting a limited torque only, the fluid coupling safeguards the chain against sudden blocking up of the conveyor. By changing a pair of the gear wheels in the reduction, *G*, one can choose chain speeds of 100, 150 and 200 fpm according to production expected.

• **Control and Lighting**—The face sides of the conveyor troughs carry the 4.25-in tubes forming the planer-chain return track (Fig. 5). As the tubes are 5 ft long and have 0.4 in of clearance between them, they do not hamper conveyor flexibility. The gob sides of the conveyor troughs are fitted with spill plates.

As shown in Fig. 5, the spill plates are folded to form a duct. This duct accommodates the motor cable, the conduit for the face-lighting system, and the control cable for the multiple-plate clutch at the upper end. Thus, all electric wires are protected against damage.

Lamps for face illumination are placed at the gob side of the conveyor at 20- to 30-ft intervals. These lamps also are used for visual signals. For this purpose, the lighting cable is fitted with pull switches operated by a 0.2-in-dia steel wire placed beside the conveyor. Using the pull wire, anyone at any point along the conveyor can switch all face lights on or off, thus giving any desired signal. The pipe line

Seam Conditions, Section Layout and Roof Control for Planer Operation

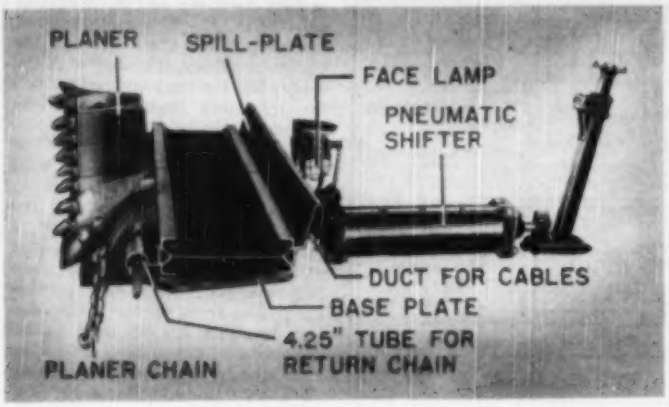


FIG. 5—CONVEYOR-TROUGH DESIGN, with planer and attachments.

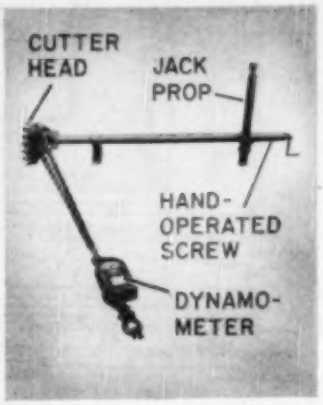


FIG. 6—COAL-HARDNESS testing device.

supplying compressed air to the pneumatic shifters used to move the conveyor also is placed on the gob side of the conveyor.

Where the coal is hard and especially when conveying is to the dip, the whole conveyor, in spite of its heavy weight, may be pushed down toward the lower entry when the planer travels upward. Such undesirable dislocation is preferably prevented by anchoring the conveyor to a steel joist at the upper end of the face. If the conveyor is not exactly at right angles to the entries, it also tends to slide toward the bottom entry each time it is advanced. Where this is the condition, the conveyor should be pulled up from time to time since dismantling is impracticable because of the cables in the duct formed by the spill plates. For this purpose, a 50- to 60-ton-pull chain block is installed between the steel joist and the conveyor.

Shifting the Conveyor

The planer, depending on its adjustment, takes 2 to 6 in of coal off the solid face. After any pass, the double-chain conveyor must be shifted toward the face the same distance to enable the planer to strip another layer on the return pass. After a number of shifting arrangements had been tested, the simplest was determined to be pushing the conveyor forward by "pneumatic shifters" attached to the gob side at intervals of 15 to 20 ft. The shifter cylinder is bolted to the conveyor while the piston-rod head is braced against a steel prop.

Since cylinders are continuously connected to a compressed-air line carrying about 90 psi, they continuously exert a corresponding force toward the face. Air consumption is small. A pneumatic shifter needs attention only after the conveyor has been shifted 30 in. The piston rod then is anchored against another prop near the coal face. This operation is performed by the timbering crew.

Each time the planer passes a pneumatic shifter, it creates an open space between coal face and conveyor equal to the depth of cut. This space is immediately covered by the conveyor as it is automatically shifted towards the face. Shifting is facilitated by the planer base plates, which slightly lift the conveyor.

● **Shifting in Hard Coal**—The cushioning effect of the pneumatic shifters provides, in effect, a guide rail sufficiently elastic to prevent the planer from becoming jammed between conveyor and coal face in case the shifters push the conveyor too close. However, where stretches of unusually hard coal occur, the planer might push the conveyor out toward the gob because of pressure greater than that exerted by the pneumatic shifters. If this happens, the depth of cut is reduced. To prevent the face from being curved, the foreman may make the planer run back and forth across the hard stretch until the face is straightened, using the lamps for signalling.

Pneumatic shifters can, of course, be replaced by hydraulic shifters which would enable mines without compressed air to install planers. Experience so far shows, however, that hydraulic power does not provide as good a cushioning effect. Preferably, a small electric compressor may be installed to provide air for the shifters.

The drive units at the ends of the conveyors are too weighty to be moved by pneumatic shifters. Therefore, each is equipped with a chain shifting device (Fig. 3). A sprocket, *D*, when engaged to reduction, *G*, by a hand-operated lever, *N*, drives a chain, *O*, that is deflected by a pulley, *P*. The end of the chain, *R*, is connected to the drive-unit frame at the double-chain conveyor. Thus, the motors driving the conveyor also provide the shifting power for the drive units.

Seam Conditions

The Loebbe Hobel planer, as previously noted, can be employed in seams 2 to 7 ft thick. Occasional reductions down to 18 in present no difficulty, since the overall height of the smallest planer is only 16 in. Nevertheless, an average seam thickness of at least 24 in is desirable to permit proper inspection and maintenance of the equipment.

The thicker the seam, of course, the higher the efficiency achieved on a planer face, as with other coal-mining machines. The capacity of a planer is approximately 1.5 tpm in 2-ft coal, and up to 5.0 tpm in 7-ft coal. Seams thicker than 7 ft can be worked provided the coal undercut by the planer comes down by itself or is brought down by shooting, or if the seam is overcut by machine.

As to seam pitch, the Loebbe Hobel planer works well between 5 deg up and 25 deg down. If pulling up more than 5 deg is required, the power consumption of a long conveyor would be too high. In pulling down in seams steeper than 25 deg, on the other hand, the lumps would roll along the conveyor, endangering workers.

Generally speaking, a coal planer works best in somewhat friable or loose-structure coal. The Loebbe-Hobel-type planer, however, also is suitable for mining fairly hard and solid coal because of its small depth of cut and the arrangement of cutting bits.

Regardless of conditions, it is advantageous to use the roof pressure inherent in longwalling to reduce planer pull.

● **Evaluating Hardness**—To evaluate the hardness factor in applying planers, G. E. Westfalia has developed a testing device (Fig. 6) for ascertaining the applicability of the planer. The essential part is a cutter head holding cutter bits in the same fashion as the planer body. This is attached to the free end of a tube connected to a pivoting prop. The swinging arm thus formed can be adjusted 30 in in length by a hand-operated screw.

In testing, the swinging arm with its cutter head is extended to cut 2 to 6 in off the coal face, depending on the depth of planer cut expected. Swinging of the arm and cutting is performed by a winch through a chain fastened to the head.

A dynamometer both indicates and records the force required to pull the cutter through the coal. When a cut is finished, the swinging arm is turned back by hand to its starting position, its length is increased by the depth of a planer cut and the performance is repeated. In experience so far, it is necessary to repeat the operation until the cutters, which move in concentric circles, have penetrated about 24 in into the solid coal at the apex of their circular path. This is equivalent, for example, to eight cuts 3 in deep.

If none of these eight cuts required a pull in excess of 10 tons, the Loebbe Hobel planer can mine the seam by taking cuts 3 in deep without any preparation, such as shooting or cutting. That is the experience at Friedrich Heinrich colliery. It does not seem necessary to test more than 24 in into the coal. Exceeding that depth would possibly create conditions that do not occur in planer faces, where roof pressure opens the cleats only a fairly short distance in from the general face line. Moreover, the extremely high pulling forces generated would be useless in determining whether the seam can be mined by planer operation.

● **Loading Applications**—In seams too hard for the Loebbe Hobel to work without preparation, the planer can be profitably used as a loading machine, turning the coal produced by machine cutting and shooting over to the face conveyor. A system of this kind is being operated at Kohlwald colliery, in the Saar, in a very hard 5-ft seam. The output per man-shift obtainable is high but production per day is less because coal is not continuously produced.

It may be surprising that the Loebbe Hobel planer, in spite of a small cutting depth of 2 to 6 in, produces little less large coal than methods previously employed. At Friedrich Heinrich, in a 42-in seam with a cutting depth of 3 in, 30% of the output consists of lumps over 5 in (Fig. 9). The explanation lies in using roof pressure, with the result that the planer tears the coal from the solid instead of stripping off thin layers.

Planer-Section Layout

The Loebbe Hobel planer is suited for operation on longwall faces 150 to 800 ft long. As the planer cannot work clear to the ends of the face, recesses, or stables, have to be made when the entries are driven or while coal production is progressing. Naturally, the productivity of the crew working the stables is less than that of the planer crew, especially in seams less than 40 in thick. Therefore, the faces should not be too short. Only in exceptional cases should the faces be shorter than 150 ft, for instance, in seams thicker than 6 ft.

The upper limit of face length is about 800 ft. With a greater length the combined power demand for conveyor and planer becomes too great. The more a seam dips in the conveying direction, the longer the face may be without excessive power consumption.

Except for seam faults, a Loebbe Hobel planer face should be mapped for an advance of 1,500 to 3,000 ft along the strike. Retreat is preferable to working on the advance because, with the high rate of advance in planer operation, the necessity for brushing top and bottom in entry driving may be a bottleneck. Furthermore, entry driving for retreat working will reveal seam faults.

● **Production Possibilities**—With a face 600 ft long advanced 2,500 ft, about 160,000 tons of coal is opened up in a seam 36 in thick. This 160,000 tons can be produced in a continuous process without transporting either the coal-production machine or the face conveyor. Assuming two working shifts per day and an advance of 10 ft per shift, 640 tons per shift or 1,280 tons per day is produced in a panel of the dimensions assumed to be suitable for using the Loebbe Hobel planer. The producing period is 125 working days.

The longwall face at Friedrich Heinrich colliery is shown in Fig. 7. In this planer face, conforming to German coal-mining practice, there is only one heading each at the upper and lower ends of the face. In both headings the floor, as well as the roof of the seam, are brushed to obtain sufficient cross section for ventilation and for a supply track. In lieu of these relatively wide headings, multiple-heading entries are planned for future work. Only the main belt heading will be brushed, per American practice (Fig. 8). The headings bordering the face will be driven wide enough to obviate the need for making stables at the upper and lower ends.

Roof Control

Roof support in a planer face must be adapted to planer operation. As soon as the double-chain conveyor, after completion of a number of trips by the planer, has advanced a certain distance, e.g., 20 in, a row of steel props and steel forepoling bars are set (Fig. 7). The steel bars are long enough to extend to the coal face and support the roof above the double-chain conveyor. Bars can be made of aluminum alloy instead of steel. The former are lighter in weight and more elastic, therefore contributing to increased performance.

Prop distances depend on roof conditions. In the planer face at Friedrich Heinrich (Fig. 7), the distance between the individual props along the conveyor line is 40 in. The next row of props is staggered after the conveyor is moved 20 in. Therefore, bars are spaced on 20-in centers.

● **Good Roof Control**—Satisfactory roof control in most seams is achieved by caving the roof along a breaking line formed by the last row of props and bars. If the roof shows a tendency to periodic pressure, roof control can be improved by packing strips in the gob 10 ft wide on 20- and 30-ft centers. In most seams, however, this additional roof support is not necessary, as the breaking line in continuous planer operation advances 6 to 12 ft per shift, and the roof breaks quite regularly.

The best performance of a timbering crew, as well as the best roof

Coal Planer More Than Doubles Face Tonnage at German Colliery

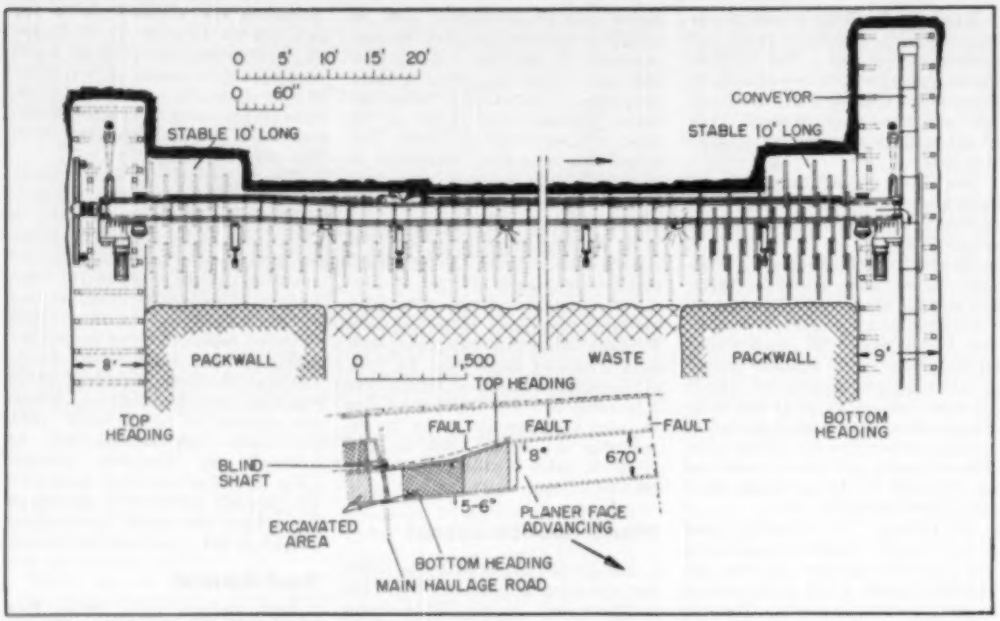


FIG. 7—PLANER-FACE LAYOUT in 42-in Bluecher seam, Friedrich Heinrich colliery.

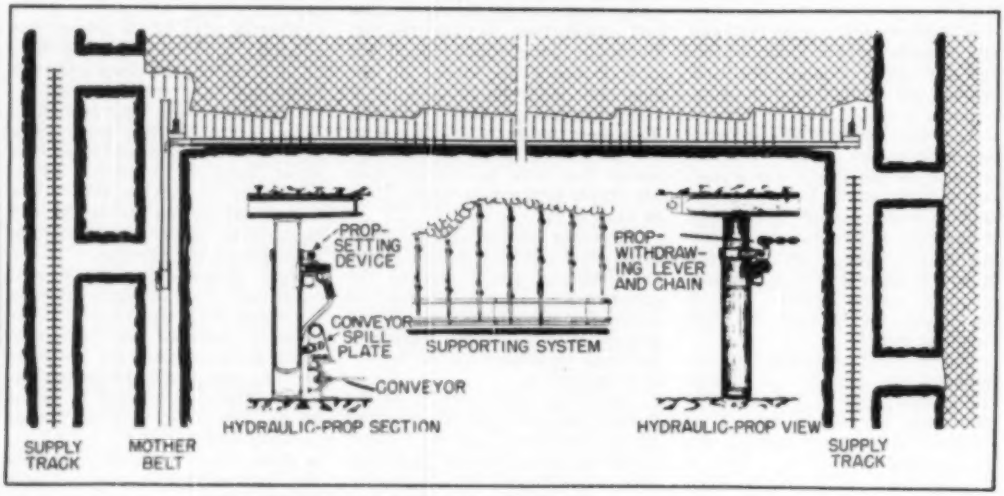


FIG. 8—PLANER-FACE LAYOUT with double-heading entries and hydraulic props.

control, are obtained if the props and bars to be set along the conveyor are withdrawn from the breaking line by the same crew immediately before setting. With this system, the work of the timbering crew consists of withdrawing the gob props and then resetting them on the gob side of the conveyor which, in the meantime, has advanced 20 in along the strike.

The performance of the timbering crew is handicapped by difficulties in handling the heavy steel props of the usual types. Therefore, a new timbering method is envisaged in which novel hydraulic props are used (Fig. 8). These hydraulic props, designed by G. E. Westfalia, have a load capacity of 40 tons and are quite easy to handle. With these props, a reduction in number of men required for timbering and an improvement in timbering crew performance may be reasonably expected.

• **Safety Considerations**—Accidents from falls of rock are avoided to a considerable extent with the Loebbe Hobel planer, since men work on the gob side of the conveyor where the roof is always completely supported by props and bars. There is no danger of explosive gases accumulating, since, in longwall mining, the face is ventilated by the

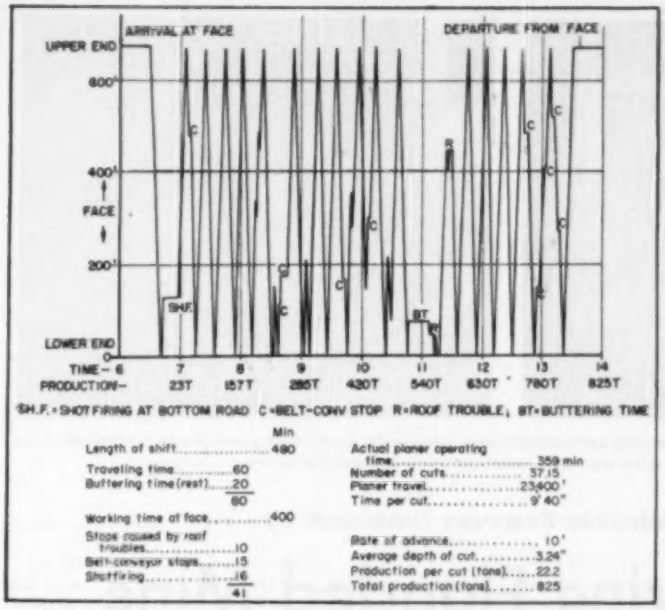


FIG. 9—TIME STUDY, new-type planer at Friedrich Heinrich colliery, Jan. 26, 1950.

full air current of the panel without leakage. Shooting is completely eliminated except as necessary in brushing headings.

Dust production is extremely low in planer operation compared with machine cutting. Normally, all that is necessary is to install water sprays at the conveyor discharge points and at the loading station.

Friedrich Heinrich Experience

The Loebbe Hobel planer has been operating about 2 yr in several mines in the Saar district and, in the near future, will be installed in a number of collieries in the Ruhr and the Netherlands. Friedrich Heinrich colliery, in the western part of the Ruhr district, produces 6,500 tons of bituminous (coking) coal per day from eight seams 2 to 7 ft thick.

Some 1.4 million tons have been mined by the original type of coal planer in the last few years. A Loebbe Hobel planer has been working since October, 1949, in the Bluecher seam at Friedrich Heinrich. Seam thickness is 42 in, with occasional reductions down to 33 in. The bottom is sandstone and the roof is 7 to 16 ft of slate with an overlying unworkable 20-in seam. The immediate roof is friable and, therefore, conditions are not too favorable for mechanization.

The planer face, which is worked advancing (Fig. 7), is 670 ft long, with a dip of 5 to 6 deg in favor of the load. The seam is dry and produces but little methane, although the coal contains 23% volatiles.

All electric installations are flameproofed in conformance with safety regulations. The face is ventilated by 12,500 cfm of air. An auxiliary fan is installed in the bottom heading only, which is driven about 50 ft in advance of the face for determining seam conditions. The Bluecher seam is the hardest of all the seams in the mine. With caving particularly, the coal is so hard that tons per man drops excessively with the usual coal-production method, i.e., machine cutting and hand-loading onto face conveyors.

Service headings supported by steel props and steel bars are driven at the top and bottom ends of the face. The top heading is 8 ft wide and 7 ft high and the roof is brushed. The heading is equipped with a supply track. The bottom heading is 9 ft wide and 7 ft high, floor brushed. A scraper is installed in this heading to take the coal away from the planer conveyor. The scraper discharges to a 32-in belt conveyor 1,500 ft long. At the loading station in a locomotive haulage road the coal is discharged from the belt into mine cars.

● **Production and Personnel**—As the machinery required for entry-driving at the proper rate is not yet available, the planer operates only one shift per day. With the face advancing at a rate of 7 ft, production was 557 tons per shift and per day in December, 1949. In January, 1950, the rate of advance increased to 8 ft per shift. Consequently, production increased to 660 tons per working shift.

To ascertain the working capacity of a Loebbe Hobel planer, provided no bottleneck exists in gate-road transportation, time studies were made on single days in January, 1950. The graph in Fig. 9 was compiled from data obtained Jan. 26, 1950.

Over-all working time was 8 hr, including 30 min travel each way and a 20-min rest period. Actual time at the face, therefore, was 6 hr 40 min. Delays during this time from causes stated in the graph totalled 41 min, making the total working time 359 min. The planer itself made 37 cuts and traveled 23,400 ft. Face advance was 10 ft; seam thickness, 42 in. The area mined was 6,700 sq ft. Production was 825 tons.

For an average production of 660 tons per working shift in January, 1950, these 58 men were required:

Working Shift—Operator, 1; stable men, 4; mechanics, 2; electrician, 1; supply of materials, 2; timbering and packwalls, 32; brushing gate roads, 8; foreman, 1; supervisor, 1; total, 52.

Additional Shift—Mechanics, 4; electrician, 1; supervisor, 1; total, 6.

With this personnel, the performance of the face workers is 11.5 tons per man-shift against 5 tons per man-shift in loading onto a face conveyor by hand. Without doubt a reduction in the number of timber men will be possible after introduction of the new hydraulic props. Consequently, performance per face worker will further increase.

The new Loebbe Hobel planer, designed on the basis of experience gained with the original planer, is a coal-production machine suitable for mining seams 2 to 7 ft thick in a continuous longwall process without any loss of coal. Even in thin seams with 24 to 40 in of coal, production per shift is high. Performance of face personnel is 10 to 15 tons per man-shift in thin seams. This performance can rise to still higher figures if bottlenecks in driving headings are eliminated—for example, by changing to retreat operation—and if the handling of timbering equipment is eased.

PUMPING STATION contains 720-hp drive motor (left) and 7,000 gpm volute pump (right) for dewatering flooded mine to release pillars for mining, increase safety and make available an ample supply of breaker water.

Duryea Anthracite Co.'s Minable Reserves Increased by . . .

Dewatering Flooded Mine

Higher Daily Production, Increased Safety and Ample Breaker Water Are Benefits Anticipated From New Pumping Station at Packer Colliery — Holding High-Pressure Lines a Major Problem

TWO 12-IN DRAINAGE HOLES through a barrier pillar hold promise of perhaps doubling the present production of 350 tons per day at Packer colliery, Duryea Anthracite Co., Laflin, Pa.

The company recently obtained mining rights to an adjoining property, formerly operated by Conlon Coal Co. but idle for the past several years. The mine filled with water during the shutdown, and it is estimated that 300 million gallons were impounded before the new pump at Packer began to dewater it. The two properties are separated by a 200-ft-wide barrier pillar in the Bottom Red Ash and the Middle Red Ash veins.

When the dewatering job is complete, Duryea Anthracite, headed by Pasquale (Tony Rose) Adonizio, president, and his son Charles, general manager, will realize these benefits:

1. **Safety will be increased.** It is impossible to appraise the effects of the 240-ft head on the barrier pillar. Packer will be safer

BOLTS ARE ANCHORED into rib and bottom (left photo). Pump protection is provided by 18-in strainer (right photo) which traps foreign material in the suction line. Clean-out ports are opened periodically to flush the strainer.

TWIN BOREHOLES with positive-control valves tap the pool. George Keib (left), superintendent, and Harold Powell, engineer, supervised installations. Mr. Powell (right photo) points out expansion bolt and steel band holding line in place.

when this pressure is relieved.

2. **More coal will be available for mining.** On the Packer side, reserve pillars in the Bottom Red Ash, Middle Red Ash and Ross veins, left in place to keep strata intact above and below the barrier, will be released. On the other side of the barrier, pillars in the Ross, Middle Red Ash and Bottom Red Ash seams will be released.

3. **An ample supply of breaker water will be assured.** The pump discharges the acid mine water to a dam where it is neutralized with lime. Breaker water is pumped from this dam.

4. **A high-capacity sump will be provided.** The holes tap the flooded mine at the low corner, thus easing the problems of controlling the water in the future by providing a natural basin.

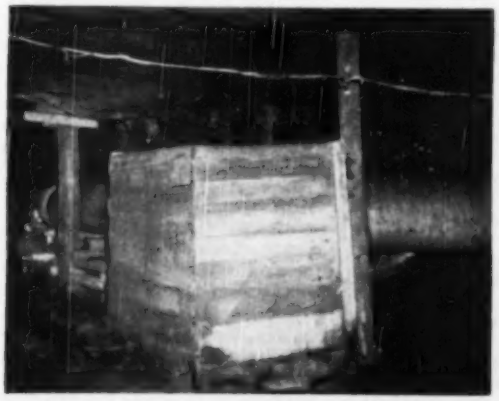
A borehole from the surface was ruled out as a possibility because of deep cover, surface development and broken strata from previous mining in the upper seams. Therefore, it was decided to drill through the barrier pillar and draw the water off through a pumping station in Packer.

● **Preliminary Exploration**—A contract was awarded for drilling a 2-in exploration hole and the final 12-in drainage holes to Sprague & Henwood, Inc., Scranton, Pa., whose drill-crews operated under the direction of Harold Powell, Duryea Anthracite mining engineer.

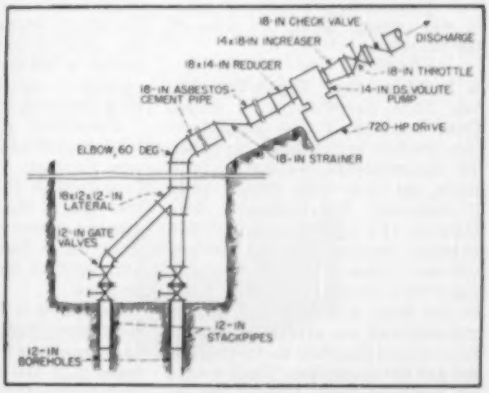
For drilling the exploration hole, Mr. Powell located the drill in a chamber off No. 5 slope, as shown on the map. When the project started, the face of this chamber was 10 ft past Sta. 1104, the chamber being completed after core sections from the exploration hole established the fact that it could be driven with safety.

The first hole was pitched at 4 deg because it was predicted that the bit would drop away from this projection as the hole became longer. This was true; the bit dropped about 8½ ft from the projection in the 313-ft length of the hole. But, as expected, the hole tapped an opening in the Bottom Red Ash vein, 4 ft in thickness, on the other side of the barrier in the flooded property.

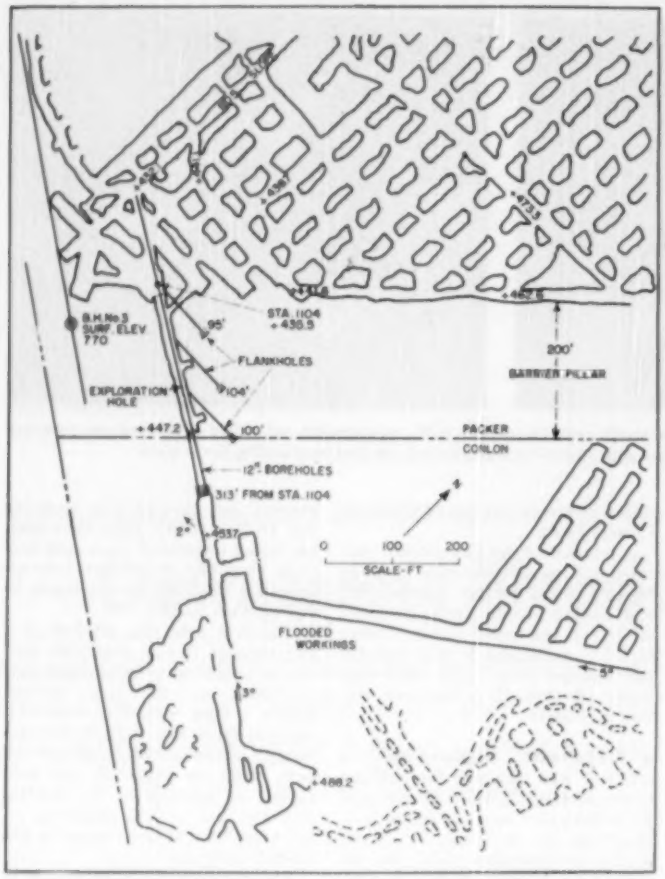
The chamber was then driven to a place 100 ft from where the exploration hole tapped the flooded mine, the 100-ft interval serving as a solid dam between the properties. Flankholes were drilled into the



REINFORCED CONCRETE surrounds elbow to prevent pressure from kicking out elbow. Anchoring at all points of strain aids safety.



PUMPING-SYSTEM LAYOUT features positive control in duplicate elements at all likely trouble spots.



CAREFUL PLANNING and safe operating methods led to successful drainage of Conlon mine and subsequent release of pillars on both sides of barrier pillar. Seam dips toward borehole for complete drainage.

ribs as the chamber was driven to make certain that a protective barrier of sufficient thickness for safety was present along the sides of the chamber.

● **Drilling the Boreholes**—The two 12-in boreholes were drilled from the face of this chamber to the opening in the adjoining mine. To accommodate 9-ft-long stackpipes, the holes were started 16 in in diameter. The stackpipes were inserted and held in place by 6-in H-beams hitched into the bottom and roof. Spaces around the stackpipes were grouted to seal the pipes in the holes and then a 2-ft-thick concrete wall was erected across the face of the chamber to further reinforce the stackpipes. Testing with an auxiliary pump showed the installation could withstand a pressure of 250 psi.

The holes were core-drilled, 2-in drill rods being used to propel the bit and core barrel. In contrast to the droop encountered in drilling the small-diameter holes, the bit raised in the large holes. This was caused by sag in the 2-in rods tipping the 12-in bit upward.

Therefore, the large-diameter holes tapped at a higher point than was planned. They broke through in a cave in the roof 106 ft from the face of the chamber. The rise was not excessive and the holes now draw water from the top of a natural settling basin—a decided advantage.

Each hole is fitted with a pair of concrete-enclosed 12-in gate valves to insure positive control, and the holes join the suction line of the main pump through a 12x12x18-in lateral.

The lines from the boreholes through the pumping station to the surface consist of 2,300 ft of 18-in Transite pipe. Holding these lines in position under the impact of the water was the major difficulty encountered during the entire project.

The final solution consisted of placing $\frac{3}{8}$x3-in steel bands on each side of the pipe couplings and securing these bands to the ribs or bottom with $1\frac{1}{4}$-in expansion bolts. Also, where the suction line turns from the chamber into the slope, the 60-deg bronze elbow was enclosed in a block of reinforced concrete to prevent the pressure from kicking it out. George Keib, mine superintendent, who supervised the work of restraining the water lines, reports good results with these anchorages.

● **Pumping the Water**—The pump is a 700-hp Barrett-Haentjens double-suction volute pump with a rating of 7,000 gpm against a 300-ft head at 1,750 rpm. The drive, connected to the pump by a flexible coupling, is a 720-hp, 2,300-v, 1,780-rpm, three-phase Westinghouse induction motor. The drive and pump are track-mounted for convenient installation or removal of the unit as necessary.

The three-conductor power cable, supplied by Hazard-Okonite, Wilkes-Barre, Pa., is carried down the slope airway to the pumping station. Protective devices and controls consist of General Electric Type FK-20 oil circuit-breakers, 5,000-v phase fuses supplied by Line Material Co., and a Cutler-Hammer Hi-Tension automatic starter.

Discharge of the constant-speed pump is throttled by a gate valve, and a check valve assures a full discharge line at all times. An 18-in Hazleton strainer, also supplied by Barrett Haentjens & Co., traps foreign matter in the suction line to protect the pump. However, the accumulation of foreign matter has not been excessive because the intake of the boreholes is near the top of a natural settling basin, as mentioned.

The water in the flooded mine rises to an elevation of approximately 700 ft, which also is the elevation of the discharge on the surface. The pump is installed at an elevation of 460 ft.

The installation operates efficiently and Duryea Anthracite is proceeding with its plans to reopen the flooded mine. A tipple now is being constructed to handle the coal that will be brought from the reclaimed workings.

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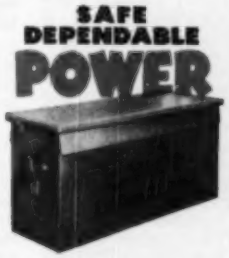
You can count on instant starting and rapid acceleration when your locomotives, trammers and shuttle cars are powered by Exide-Ironclad Batteries. They help speed up car changes, keep your loaders busy and main line haulage moving fast. They give you lasting power—assuring uniform speeds straight through to end of shift. Also, with Exide-Ironclad Batteries you eliminate unscheduled down time for repairs, resulting in more production per man per shift.

The Exide-Ironclad Battery is *DIFFERENT* from all other batteries in design, construction, performance. The outstanding difference is the *exclusive* positive plate. Since 1910, this plate has continued to prove its superior operating characteristics and exceptional long life in more than 100,000 heavy-duty jobs . . . and at operating and maintenance costs that are extremely low.

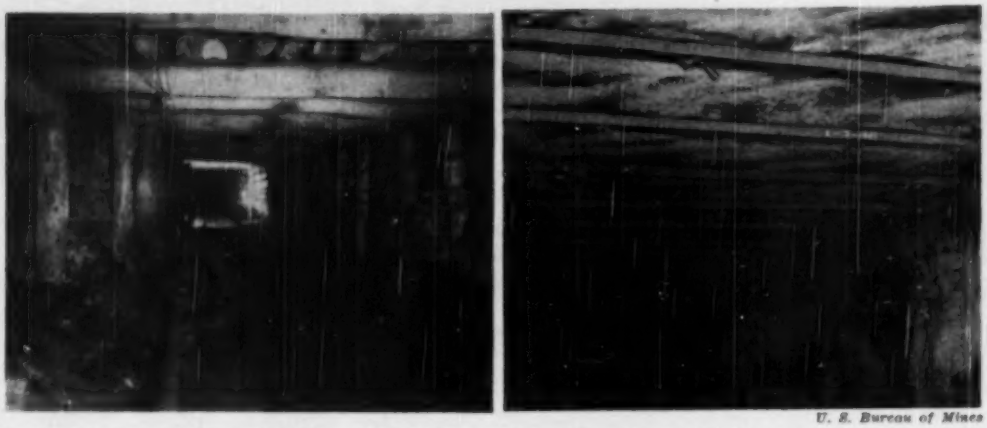
Combined, the important characteristics of Exide-Ironclads provide safe, dependable full-shift power for mine haulage units, making Exide-Ironclad Batteries the best power buy . . . *at any price.*

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto



"Exide-Ironclad"
Reg. Trade-mark U. S. Pat. Off.

1888 . . . DEPENDABLE BATTERIES FOR 62 YEARS . . . 1950



U. S. Bureau of Mines

How Conventional Timbers and Suspension Supports Help Control . . .

Beam Action in Mine Roof

Mine Roof Shows Characteristics of Typical Structural Beams—Limited Elasticity Introduces Roof-Control Problems—Bolts, Pins and Timbers Help Solve These Problems by Reinforcing Roof Strata

SUPPORTING MINE ROOF with steel bolts and wood pins has received considerable attention because of the distinct advantages it offers in wider clearances, more ventilating area, fewer supplies and, last but not least, effective roof support in mines where controlled experiments indicate it will do the job safely. Many examples of successful bolt and pin installations have been described in recent technical articles, but this Foremen's Forum brings to your attention some of the theory of mechanics with regard to beams, which seems to be the best way to explain why roof bolts are so effective.

The mine roof considered here is the immediate roof and differs from the main roof which makes up most of the cover. Most serious roof-fall accidents result from failures in this immediate roof, where beam action is most evident.

The following definitions will be the basis for later comments.

A *beam* is a horizontal load-carrying member subject to shearing and bending forces, which will fail or break when the external load exceeds the resistance that the fibers of the beam are able to offer.

Shear is the internal stress on any cross-section of a beam that results from opposing forces on each side of the section under consideration.

Tension and *compression* are stresses induced in the fibers of a beam as a result of the bending caused by the load on the beam. As a beam sags under a load the bottom fibers of the beam are in tension and the top fibers in compression. If the load is too great, the top fibers crush and collapse, the bottom fibers tear apart and the beam fails.

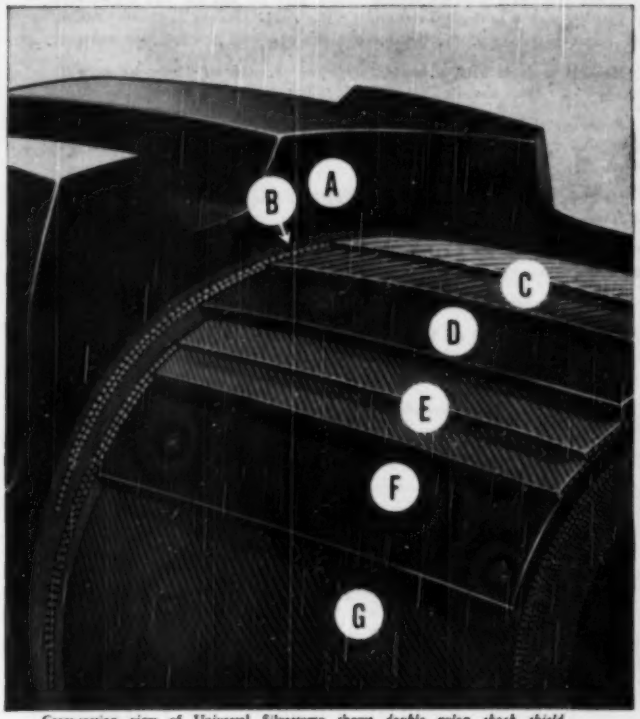
Beams may be classified according to the manner of their support, or the way they are connected to the structure of which they are a part. In mining applications such a classification would include *simple, cantilever* and *continuous* beams.

A simple beam is merely supported at both ends but not restrained in any way. It is free to bend or deflect under load. The closest approach to this condition in mining is the conventional three-piece timber set, in which the ends of the beam, or crossbar, are somewhat restrained by the legs and the cap pieces. This type beam, with a concentrated load at the center, is relatively weak, and this is the big reason for not driving a wedge over the center of a crossbar. If this were done, any sag in the roof would load excessively the center of the beam.

A cantilever beam is rigidly restrained at one end and unsupported at the other. In some wide rooms the prop-and-bar method of timbering is used, and this is especially true where track is laid in the room. Two legs on one side of the track support the bar which projects out over the track. The projecting portion of the bar is a cantilever.

A continuous beam is fixed or simply supported at the ends and supported at one or more points along

B.F.Goodrich



Cross-section view of Universal Silvertown shows *double nylon shock shield.* (A) Extra-thick, cut-resisting tread rubber. (B) Cushion strip. (C) Top layers of nylon shock shield. (D) Heavy cushion strip. (E) Lower layers of nylon shock shield. (F) Heavy cushion strip. (G) All-rayon cord body.

Universals at work in a coal mine. Note husky, wedge-shaped cleats. Tire is non-directional, may be mounted either way on any wheel . . . cuts tire inventory!

WANTED: Maximum traction — Here, BFG coal mine tires move 65-ton loads through soggy going. Specially designed tread also helps prevent sideslip.

Nylon shock shield—the reason only BFG can give you more tire per dollar!

COAL MINING jobs are *tough on tires.* But the tougher the job, the higher the praise for B. F. Goodrich mine tires. BFG tires chalk up performance records because of special, *exclusive* construction features.

The nylon shock shield, for example —strong, elastic nylon (see illustration above) absorbs and distributes impact, protects the rayon cord body. Nylon shock shields are built into all BFG coal mine tires and double nylon shock shields in all tires, size 12.00 and larger. And *only* B. F. Goodrich gives you this added protection, the added savings of (1) longer tire life (2) more recappable tires (3) greater bruise resistance (4) less chance of tread separation.

Also, BFG puts nylon to work for mine operators in additional ways. In large size tires which may require even greater protection on extremely tough jobs . . . *All-Nylon* construction is used. To the operator, the All-Nylon tire is a case of "paying a little more for a lot more" for consider this: *in all tests not a single All-Nylon tire blew out, not one flex break occurred!*

For complete details on BFG mine tires call your local dealer or write direct: *The B. F. Goodrich Company, Akron, Ohio.*

its length. A long crossbar with three or more supporting posts is a continuous beam.

Mine roof also exhibits beam characteristics similar to those of the wood supports in the foregoing beam descriptions. For example, the roof across an unsupported entry is like a simple beam. It is somewhat restrained at the ends, it carries a load imposed by its own dead weight, and it sags under this load.

The roof across a wide room or along an entry is like a continuous beam. It is supported at intermediate points by props and timber sets, which contribute to its load-carrying capacity.

The most striking example of beam action in mine roof is the cantilever behavior of immediate strata during pillar-recovery work. This is most noticeable when it causes trouble by initiating squeezes. The dead weight of the immediate roof bends this strata against the restraining effort of the coal in the pillar and the rock in the main roof, causing the solid coal at the face of the pillar to crumble. If the break does not occur to relieve this condition, the pillar will crush and a squeeze is underway as a result of cantilever action in the roof. This is a matter of the support breaking when it is desired that the beam break.

Mine roof, however, differs from beams usually encountered in structural work because it is a beam of indefinite width. The mine foreman must constantly be concerned with supporting his beam, the mine roof, in two directions, across the opening and along the opening.

Elasticity also is a factor in beam action. It is a property that depends entirely on the material in the beam. A deflection or sag results when a load is placed on a properly-designed beam, and when the load is removed the beam returns to its original shape and position. There is a limit to elasticity, however, and if the beam is subjected to an excessive load it will retain all or some of the deflection when the load is removed. Thereafter the load-carrying ability of this beam is greatly reduced.

The elastic properties of concrete, masonry, stone and rock are very poor in beam applications. The maximum allowable deflection for these materials is very small in comparison to that of steel or wood. For this reason concrete and other masonry materials are never designed to resist tensile stresses. They are always reinforced in beam applications, with the reinforcing material provided for the sole purpose of absorbing tensile stress. By the same token, mine roof must be protected from excessive tension in the lower fibers, insofar as this is possible.

Heretofore, excessive deflections in mine roof, which result in excessive tensile stress, have been prevented by the artificial support provided by timbers, posts, jacks and other media. Roof bolts and wood pins now have been added to further limit roof deflection by locking strata or blocks into competent beams.

Stratified roof corresponds to a wood beam made of a number of planks, one atop another. It is evident that a load placed on this wood beam will cause the surfaces of the planks to slide across each other as the beam assumes a certain deflection or sag. If the friction between the planks could be increased the sliding action would be hindered, and the same load would produce less deflection. The two most effective means of increasing the friction between plank surfaces are (1) squeezing the planks together by the use of tightened steel bolts, and (2) drilling through the series of planks and driving wood dowels into the holes.

The first method increases friction, and thereby limits deflection, by increasing contact pressure between the planks. The second method increases friction by adding resistance to sliding up to the ultimate shear strength of the dowels, and by further addition of the skin friction between dowels and planks.

Bolts and wood pins perform similar functions in stratified roof.

Some types of roof, however, exhibit greater weakness in shear than in bending, as in those instances where roof shows a tendency to break first at the rib lines. Bolts have relieved this condition at certain mines by being inserted on an angle, with the anchorage in the roof over the pillar. Successful examples of this practice indicate that perhaps the shear strength of the roof has been increased by the shear strength of the bolts.

Engineers at other mines tell of successful bolting of broken unstratified roof, which they describe as a process similar to reinforcing a stone arch when any one of the stones might be the keystone.

Such examples as these emphasize that it is possible to oversimplify roof control problems by concentrating on the beam theory. On the other hand, the beam theory does offer a good basis for initiating a discussion of roof control.

Food for Thought

In the office of Coal Heating Service of Franklin County (Wash.) is a bronze plaque on which are embossed the following inspirational words:

"When Abraham Lincoln was a young man he ran for the legislature in Illinois and was badly swamped. He next entered business, failed, and spent 17 years of his life paying the debts of a worthless partner.

"He fell in love with a beautiful young woman to whom he became engaged . . . then she died.

"Entering politics he ran for Congress and was badly defeated. He then tried to get an appointment to the United States Land Office, but failed.

"He became a candidate for the United States Senate and was badly defeated.

"In 1856, he became a candidate for the Vice Presidency and was again defeated.

"In 1858, he was defeated by Douglas.

"But, in the face of all this defeat and failure, he eventually achieved the highest success attainable in life, and undying fame to the end of time."

. . . And we talk of discouragement in the coal business!

—Reprinted from COAL DUST, Retail Dealers' Association of Seattle

All these Valves . . from One!

Valve combinations for 90% of industrial piping assembled with 4 bodies and a handful of parts.

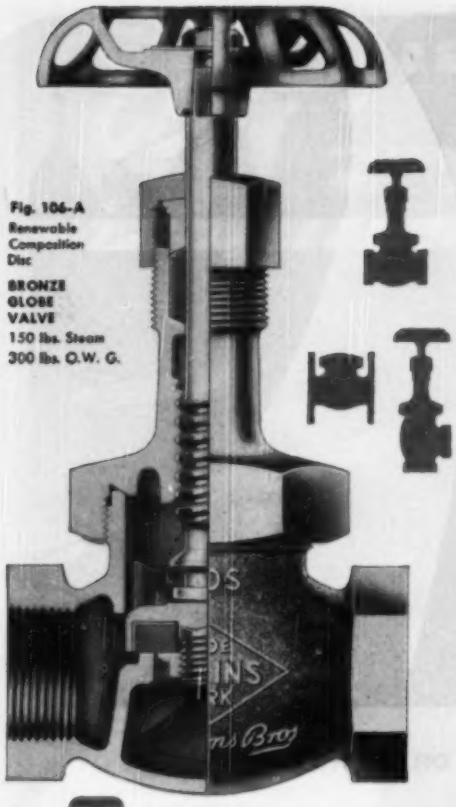
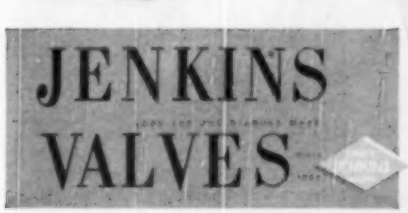


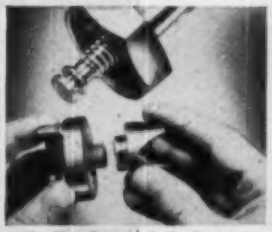
Fig. 106-A
Renewable Composition Disc

BRONZE GLOBE VALVE
150 lbs. Steam
300 lbs. O.W. G.

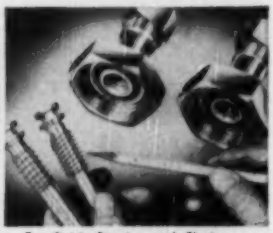


JENKINS FIG. 106-A "FAMILY"

Start with the standard Fig. 106-A. Trimming is interchangeable in Globe or Angle body, screwed or flanged.

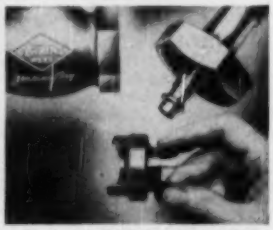


For Close Control — In throttling service, the nut which holds the disc in the disc holder is removed and replaced with Throttling Nut, Fig. 344.



For Quick Opening and Closing — Merely substitute the bonnet and spindle from Fig. 941, in which threads are pitched more sharply.

For Lift Check Service — Globe or Angle Bodies can be fitted with interchangeable Cap, Disc Holder, and Guide Disc Nut from Fig. 117A. Addition of spring from Fig. 655A provides spring loaded service.



For Stop & Check Service — Use the 106A trim, but substitute this spindle from Fig. 630A and replace the regular disc nut with the check valve guide disc nut.

Look over these pictures and see how easy it is to make up just the valve type you need, simply by interchanging parts. Think of the saving this means in maintenance expense . . . in reduced inventory of spare valves in your stockroom.

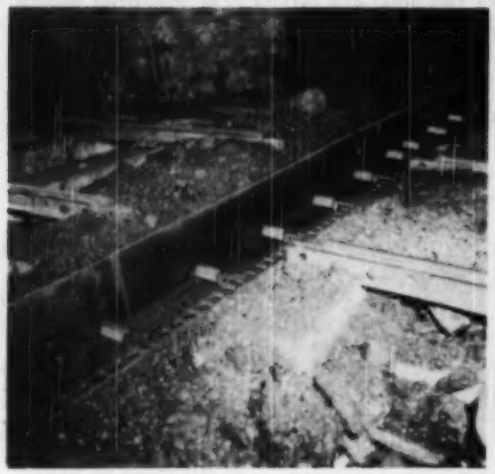
That's a big reason why the Fig. 106-A series takes top honors in any poll for valve preference. And Jenkins time-proved design, makes them the longest-lasting, lowest-upkeep valves that money can buy.

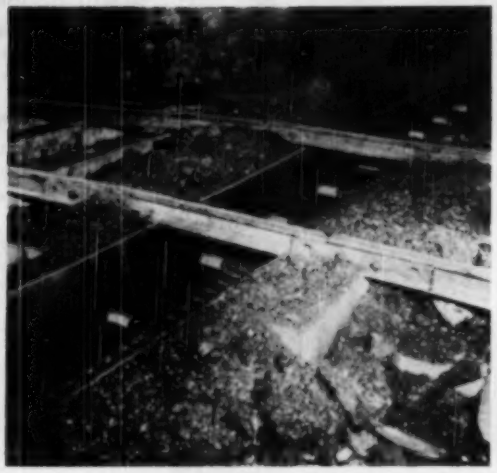
For example, see the heavy construction of the one-piece, screw-over bonnet. You can remove and replace it over and over again without distortion. See the extra size packing box,—and the perfectly machined threads on the heavy manganese bronze spindle, with more threads in contact with the bonnet, open or closed.

Remember, Jenkins Bros. is the originator of the renewable composition disc valve,—the *only* manufacturer of both valves *and* discs. For drop-tight, trouble-free performance, get acquainted with the Fig. 106-A "family". Despite their extra value, *you pay no more* for Jenkins Valves. Jenkins Bros., 100 Park Ave., New York 17, N. Y. Jenkins Bros., Ltd., Montreal. Sold through leading Industrial Distributors.

JENKINS VALVES

Operating Ideas





Supply Cars Cross Conveyor on Removable Rails

DEVELOPMENT of easily removed crossings makes it practical to extend supply tracks beyond conveyors and save handling labor at Bolair No. 1 mine of the Pardee & Curtin Lumber Co., Bolair, W. Va. Formerly, supplies were hauled in mine cars to the first conveyor in the section, where they were unloaded and taken manually into the section.

As shown in the photographs above, about 5 in of the base flanges are cut from each end of the short jumper rails so that the web will slide down into the slots formed by the angle bars on the ends of the permanent track. With the jumper rails removed, the conveyor operates without interference. Installation of the crossing rails when needed is a very simple matter.

Fan Stoppage Gives Warning in Main Shop

AN UNSCHEDULED STOPPAGE of the fan at Frederick mine, Colorado Fuel & Iron Corp., Valdez, Colo., sounds a warning bell and lights a red lamp in the main shop, 3½ mi away, thus permitting the mine electrician to immediately start an investigation of the cause of the stoppage. The warning signal, an applied idea of C. F. & I.'s electrical department, operates as soon as the pressure difference between a main intake and return drops as the natural result of a fan stoppage.

The main components of the signal are:

1. An open galvanized pipe through one of the permanent stoppings between the intake and return.

2. A hinged flap that is closed over the end of the pipe by the suction of the fan as long as it is operating.

3. A spring strong enough to open the flap when the difference in air pressure between the intake and return is reduced.

4. A mercury switch actuated by the hinged flap that opens the signal circuit when the lid is closed by air suction but closes the circuit when the pressure differential drops and the spring pulls the flap open, thereby tipping the switch.

5. The necessary wiring from the mercury switch back to the bell and lamp in the shop.

The pipe and switch are placed in a stopping where air currents on either side are not greatly affected by opening or closing doors or by other normal mine activities. It operates on a drop in ventilating pressure only, which at this point can only result from a fan stoppage.

SPRING-LOADED FLAP tips mercury switch to close warning-signal circuit when ventilating pressure drops as result of fan stoppage.

CUT COAL COST 4/10¢ PER TON

Battery-powered shuttle cars have the following advantages demonstrated and proved:

SAFETY

Only battery cars are "permissible"

PRODUCTION

Can produce 10% more tonnage
Deliver more tons per man shift
Give 22% more ton-miles per shuttle car hour

PERFORMANCE

Include all design advances
Travel 25% faster
Discharge 30% faster
Are more dependable and predictable
Handle supplies easier
Reduce shuttle car change time
Can gob underground
Promote section efficency

COST

Equal capital cost
Produce coal in shuttle car sections for approximately ½c less per ton**
—in hand-loaded sections, as much as 75c a ton

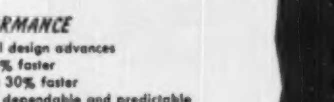
**Shuttle Car Haulage, AIME, Technical Publication No. 2198.

A "MUST" FOR CONTINUOUS MINING MACHINES

Battery-powered shuttle cars enable continuous mining machines to work 10% more of the shift.

AND . . .

Two-shift operation is now possible with only one set of batteries.



GOULD

FIRST INSTALLATION of locked-steel buildings by Spruce River a few years ago was this 24x24-ft addition to the old shop at No. 4 mine, which is now nearing completion.

AT NO. 8 MINE, developed to replace No. 4, three of the easily erected buildings include a lamphouse (left); a combined substation and shop behind it; and the tool house at the far right.

WHEN THE COMMUNITY BUILDING at Ramage burned, it was replaced by this 24x70x8-ft steel unit.

THIS NEW SCALE SHED AND HOUSE also is built of steel sections that provide both structural strength and exterior covering.

Easily-Erected Steel Buildings Serve Many Purposes

LOW ERECTION COST, high salvage value and low maintenance were the principal features that led officials of the Spruce River Coal Co., Ramage, W. Va., to standardize on Armco Steelox buildings for plant improvements. Over the last 5 yr, the Spruce River company has erected six of the locked-steel buildings, which are so designed that the individual sections provide both structural support and exterior covering.

Erection of a building in a day or so with relatively unskilled labor is an advantage that has particularly appealed to the Spruce River management. Another design feature is that a building can be extended or rearranged when required.

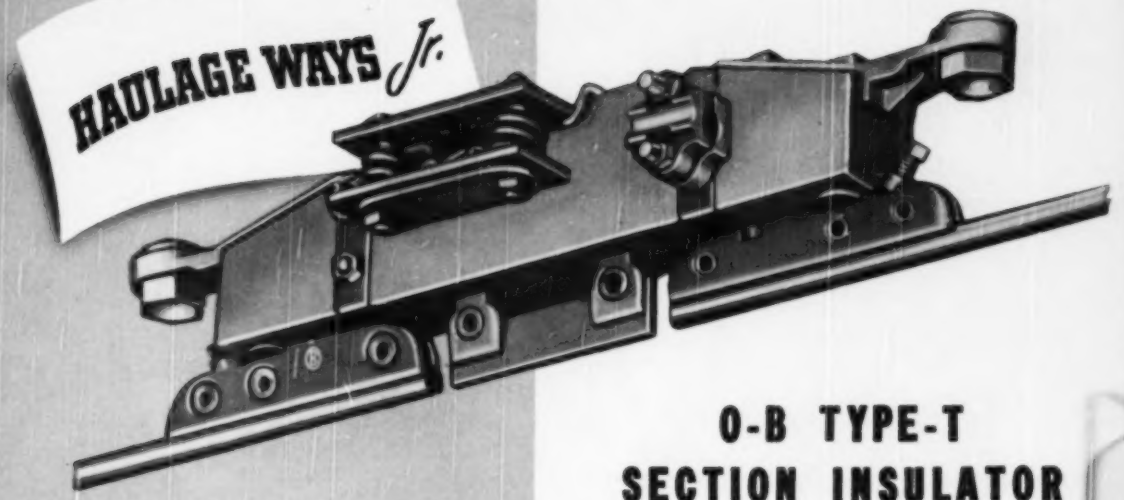
The company's installations include a needed addition to the shop at No. 4 mine, which at the time had less than a 10-yr life expectancy. For that purpose, it installed a 24x24-ft Steelox building, 14 ft high to the eaves, connected to the end of the existing building. As No. 8 mine was developed to replace No. 4 mine, three Steelox buildings were erected in the mine yard at the headhouse. The three units consist of an electric shop and substation, 24x60 ft, 14 ft to the eaves, a 12x24x8-ft lamphouse and a 12x12x8-ft tool house.

When the community building at Ramage burned, it was replaced by a 24x70x8-ft Steelox unit. The last building erected by the company is a scale shed and house at a new tipple designed especially for handling truck-mine coal, which includes facilities for dumping, blending, screening, picking and loading coal into railroad cars.

Steelox buildings are manufactured by the Armco Drainage & Metal Products, Inc., Middletown, Ohio, a subsidiary of the Armco Steel Corp.

"THERE'S MORE THAN ONE WAY TO SKIN A CAT." How about yours? If you have a good operating idea, "gadget" or "kink" that you've successfully put to work at your operation, why not let COAL AGE tell others about it? And remember, we will gladly pay you $5 or more for each acceptable "Operating Idea," on publication. Address: The Editor, COAL AGE, 330 W. 42 St., New York 18.

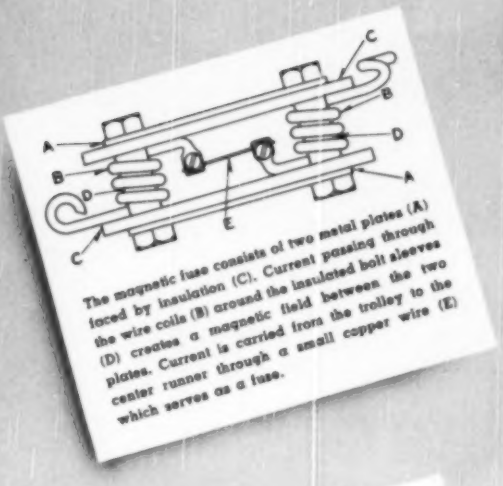
HAULAGE WAYS *Jr.*



O-B TYPE-T SECTION INSULATOR *provides*

- *Fused Magnetic Blowout*
- *Double Airgap Protection*
- *Even Power Flow to Motor*
- *Energized Center Runner*
- *Wire-Smooth Collector Path*

HERE'S a combination of wire-saving design features that prevent pit-forming arcs as the current collector passes through the section insulator. The wire path is interrupted in two places to provide double airgap protection between sections. However, the center runner is energized through a fuse with magnetic blowout, and under all normal conditions the energized center runner prevents arcing as the shoe goes through the insulator. In addition, there is an even flow of power to the locomotive; there are no "dead spots" in the wire path to cause motor surging. Your O-B representative will show you how easily you can fit the Type-T Section Insulator into your present overhead system. Ask him about it!



The magnetic fuse consists of two metal plates (A) faced by insulation (C). Current passing through the wire coils (B) around the insulated bolt sleeves (D) creates a magnetic field between the two plates. Current is carried from the trolley to the center runner through a small copper wire (E) which serves as a fuse.

The arc formed when the wire fuse blows is forced outward away from the beam and extinguished by magnetic blowout.

Ohio Brass

MANSFIELD OHIO, U. S. A.

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Many of these O-B Type BD Starters are used in conveyor service. They are also used to control pumps, compressors, hoists, fans, etc.

under any load

RELY ON O-B MOTOR STARTERS

to maintain and protect your motors

Rely on O-B Motor Starters to keep your equipment motors operating efficiently under normal loads, and to give instant protection against overload or short circuit. Here are five reasons why O-B Starters give you a dependable safeguard against electrical breakdown.

1. A sturdy, fool-proof timing arrangement starts motors smoothly and evenly, regardless of load. Commutator flashover is eliminated.

2. Contactors are arranged to fall out upon power outage, yet they automatically re-close in regular starting sequence upon power resumption.

3. Adjustable thermal unit automatically trips line contactor upon short circuit or damaging overload.

4. O-B Starters work without supervision. They may be controlled from remote control stations. When used on multiple conveyor systems, O-B Starters can be inter-connected to provide Interlocked Sequence Control.

5. O-B Starters are built for gruelling mine service. Simple, rugged construction details are a guarantee for trouble-free, long-time service.

Learn more about O-B Starters by writing Ohio Brass Company for descriptive literature, or ask your O-B representative.

GET A FIRM GRIP IN THE BOLT HOLE

with O-B Roof Support Expansion Shells and Plugs

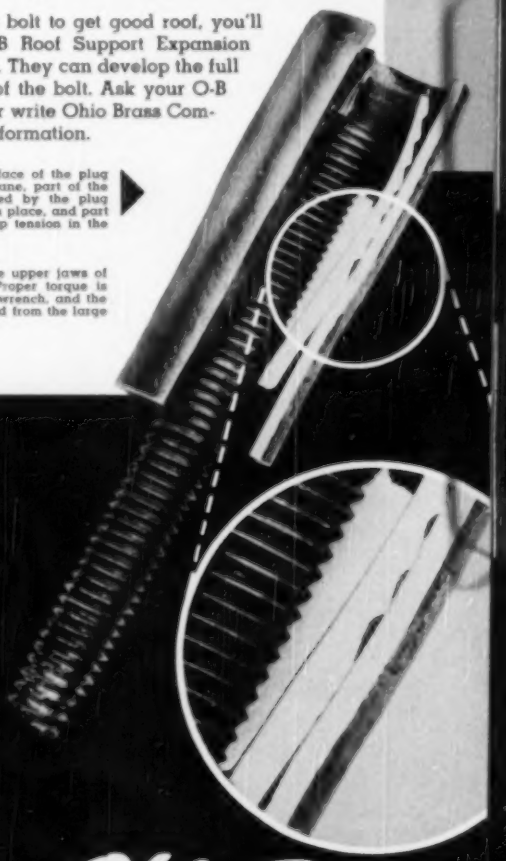
●Here's a clear demonstration of what happens when you expand an O-B Roof Support Expansion Shell and Plug unit. To get this picture, the shell and plug unit was expanded in standard 1¼ inch pipe. The method used to obtain proper torque and tension is shown in the lower illustration. Then the power feed of the testing machine was used to stress the bolt up to its breaking point. Later a section was cut away to give this view showing how the plug presses the shell outward against the wall of the hole.

A point of particular interest to operators using roof bolts is this: The plug bears on the inner surface of the shell along the entire length of the plug. All the necessary pressure between the shell and the hole wall is exerted by the portion of the shell surrounding the plug. Solid backing for the bearing area of the four shell prongs insures a secure shell contact with the hole wall over this entire area. With the plug backing the shell in this way, you are assured of continuous, constant pressure being exerted to keep the shell firmly seated in the hole.

If you want to bolt to get good roof, you'll want to use O-B Roof Support Expansion Shells and Plugs. They can develop the full tensile strength of the bolt. Ask your O-B representative, or write Ohio Brass Company for more information.

Because the outer surface of the plug acts as an inclined plane, part of the expansion force exerted by the plug holds the shell firmly in place, and part of it is used to develop tension in the bolt.

The pipe is held in the upper jaws of the testing machine. Proper torque is applied with a torque wrench, and the resulting tension is read from the large dial at the right.



Ohio Brass

MANSFIELD OHIO, U. S. A.

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

HAULAGE WAYS Jr.

O-B Automatic Couplers are

Suited to Your Cars

Can be Installed in Cars Now in Use

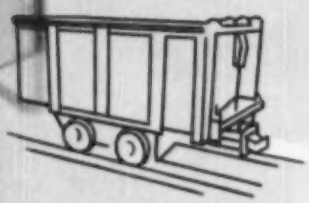
•O-B Automatic Couplers are designed for use on almost any car of three tons or greater capacity. The use of these automatic couplers is not governed by seam height, dumping method or haulage layout, even though these same factors condition the design of your mine cars. The O-B Form-8 Coupler, for example, approaches universal adaptability to all cars and operating conditions better than any other coupler offered for mine car service; there are two good reasons why this is so.

1. The O-B Form-8 Coupler imparts track stability to each car in the trip, by substituting for the ordinary single pivot point a pushing face between the cars which is 20 square inches in area. Thus car length puts no limitation on the use of this coupler.
2. The compact O-B Form-8 Coupler draft gear can be installed easily on "high seam" cars, with draft sills below the car bottom, or on "low seam" cars having the draft sills above the car bottom. Thus car height puts no limitation on the use of this coupler.

Besides these features of track stability and installation ease, O-B Couplers offer an extra-wide gathering range, positive coupler interlock, automatic self-centering for mating coupler alignment, and durable rubber draft gear of ample capacity.

You may be certain that O-B Couplers will suit your haulage conditions. Get the details by sending prints of your car design and a description of your operation to Ohio Brass Company for study and recommendations by O-B engineers.

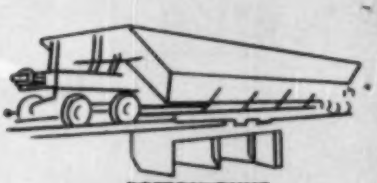
SIDE DUMP



END DUMP

O-B AUTOMATIC COUPLERS

FOR MINE SERVICE



BOTTOM DUMP

ROTARY DUMP

4052-M

Ohio Brass

MANSFIELD OHIO, U. S. A.

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Mine Welding Saves 50% in Dipper-Stick Cost

BY BUYING THE STEEL and welding it to make dipper sticks for its three shovels, the Mackie Clemens Fuel Co., Pittsburg, Kan., realizes a saving of about 50%. This saving was recently accomplished by the use of a new welding process which reduces the welding time per stick from 160 to 16 hr.

The new process, developed by the Lincoln Electric Co., Cleveland, Ohio, is known as the "Hidensity" hidden arc-welding process. Its name comes from the fact that the process employs extremely high current densities on the welding electrode wire. With up to 600 amp used on a 5/64-in diameter wire, the resulting high current on the small cross-sectional area of the wire creates the high density, which in turn makes a deeply penetrating arc that permits fast welding speeds. Using 600 amp on a 5/64-in wire melts the electrode at a rate equal to that of 10,000 amp used on a 5/16-in electrode.

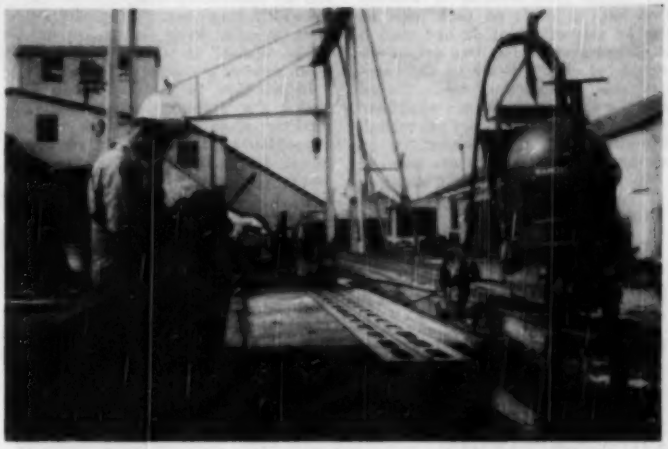
The high-density arc is completely hidden and contained under a mound of granular inorganic flux. The flux covering concentrates the heat of the arc and protects and restrains the molten weld crater to produce a smooth, dense, ductile and spatter-free weld, it is reported.

The Mackie Clemens Fuel Co. secures about 4 yr of service from a dipper stick on one of its three Marion shovels. Two are equipped with 14-yd dippers, and the third with a 27-yd dipper. Fabrication of a dipper stick for a 14-yd unit on a 5322 shovel is shown in the accompanying illustrations.

Since the shop facilities are too small for this job, Alvin Porter, master mechanic in charge of all repair and construction, does the job outdoors. First, two sticks are tack-welded to assemble the parts. A track consisting of two 12-in channels alongside the sticks is made for positioning the "Manual Lincolnweld" unit which is used for the Hidensity process.

The stick is a box structure, 52 ft 8 in long, 25 in wide and 8 in thick. The two side pieces are made of 1- and 1¼-in plate, the top bar of 1½-in plate, and bottom bar, 2-in plate. Two ¾x6x6-in angles are used as internal bracing. All material is mild steel of 0.022-0.028 carbon and 0.30 to 0.50 manganese. Single V-butt welds are placed in all four corner joints. The top and bottom pieces are vee'd to make a 35-deg angle with the side pieces.

A stringer bead is first deposited in the root of each joint with a 3/16-in E6010 hand electrode. The stick is then turned over with two portable winch trucks for positioning the joints. The joints then are finish-welded with the Hidensity hidden-arc process, making three passes in each joint.



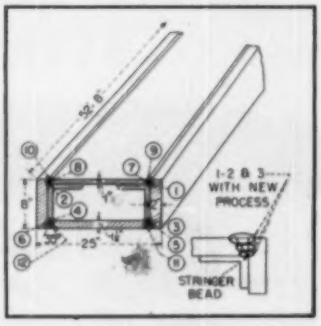
WELDING UNIT mounted on a 4-wheel carriage that moves alongside the work, together with a new welding process, permits Mackie Clemens Fuel Co. to cut welding time from 160 to 16 hr in fabricating new dipper sticks for its three shovels.

TWO JOINTS of a dipper stick for a 14-yd shovel have been completed with three passes. The new welding process is especially useful for speedily depositing large amounts of weld metal and produces dense, ductile and smooth welds, it is reported.

The welding unit is mounted on a 4-wheel truck so that it can be positioned along the stick as welding progresses. The unit contains a reel of electrode wire and an automatic wire-feed mechanism, which feeds the wire through a current-carrying cable to a welding gun. The gun, which consists of a wire-feed nozzle on the end of a cone for holding the flux, is clamped in a regular cutting-torch carriage that moves the gun along the joint. Wire is automatically fed to the work through the gun at a pre-set arc voltage and the flux is deposited by gravity from the gun around the arc. Welding current is supplied to the unit from a standard 600-amp dc welding machine located in the shop some 75 ft away.

The 500-amp welding current used permits a welding speed of 10 in per

(*Continued on p 110*



DIPPER-STICK CROSS SECTION, showing welding sequence which, together with uniform heat input, prevents distortion and provides a straight stick when finished.

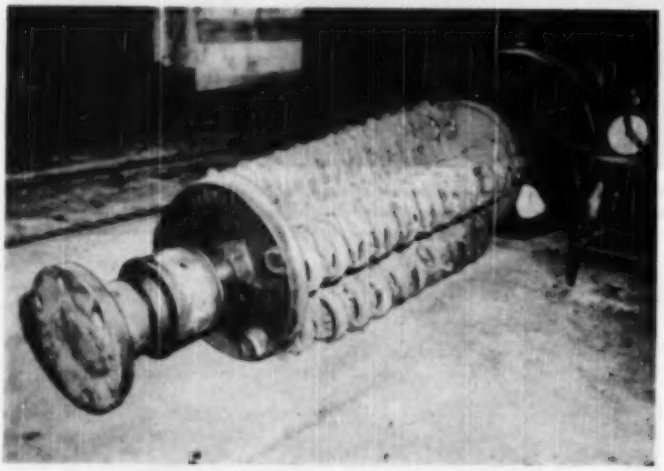
min. To insure uniform heat imput in all joints, current and speed are not varied once welding is started. One pass is made on each joint on the up side of the stick, and then it is turned over. After two passes are completed on the joints on the opposite side, the stick is again turned and the first two joints are completed with two more passes. A final turn of the stick permits completing the remaining two joints with one pass.

By following this welding sequence and keeping the heat input uniform, the dipper sticks are free of distortion and are finished up straight—the way in which they are first assembled. With regular hand welding, dipper sticks seldom, if ever, are straight when welding is completed.

In addition to fabricating dipper sticks, the special welding unit is used for other jobs which require the deposition of large amounts of weld metal. Large shafts are built up for re-machining. A shipper shaft is built up with a deposit of over 2,000 sq in of weld metal. A positioner rotates the shaft while the welding gun is held stationary. Axle shafts, hinge pins and pitch brace pins, varying in diameter from 8 to 30 in, also are built up for re-machining.

The "Manual Lincolnweld" unit is a flexible welding machine, since it can be used not only for hand or mechanized Hidensity hidden-arc welding but also for regular open-arc hand welding.

Crusher Bearings, 31 Yr Old, Still Are Good



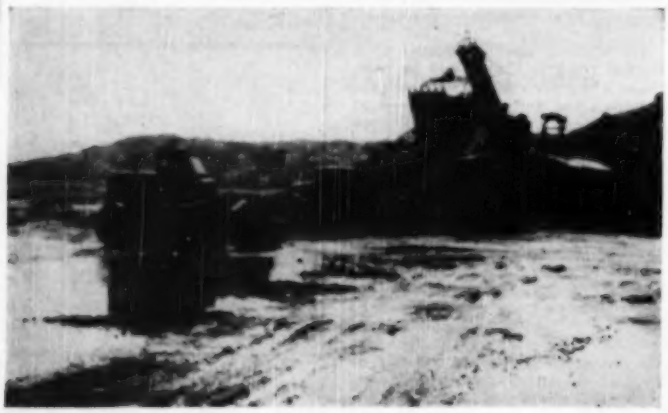
TAPERED ROLLER BEARINGS, installed 31 yr ago at Wheeling Township No. 2 mine, still give good service on the shaft of the crusher rotor.

THIRTY-ONE YEARS OF SERVICE and still good for more—that's the 1949 report on bearings installed on a coal crusher long ago and inspected last year, when the No. 2 mine of the Wheeling Township Coal Mining Co., Adena, Ohio, was closed down and dismantled. The dismantling was done by the Hanna Coal Co., which purchased the mine. The crusher was taken to Hanna's central shop at Georgetown for an overhaul preparatory to being sent to the Arkwright mine, Consolidation Coal Co. (W. Va.), for further duty.

Regarding the crusher and its bearings, the "Operating Ideas" section of *Coal Age*, October, 1941, reported:

"That it pays to specify the most advanced features in new equipment to insure trouble-free operation is illustrated by a crusher installed in the preparation plant at No. 2 mine, Wheeling Township Coal Mining Co., Adena, Ohio. To date, this unit has handled 2,574,000 tons without any repair parts.

"The crusher is an American Pulverizer Co. 60-S ring machine rated at 300 tph when breaking 6-in lump to minus ¾-in screenings. An unusual feature for the day in which it was made was that the coal-company engineer specified that Timken bearings be installed—the first such unit to be so equipped, according to information received from the manufacturer. The bearings comprise Timken Cups Nos. 854 and Timken Cones Nos. 862. Wear is indicated by the fact that to date the shims taken out of each bearing total only 0.015 in."



MULTI-PURPOSE MOBILE UNIT does yeoman service in strip pit. It is equipped with a special hydraulic dumping mechanism.

Mobile Unit Speeds Pit Jobs

A WIDE VARIETY OF PIT WORK is done by a flexible mobile unit at the strip mine of Blackfoot Coal & Land Co., Oakland City, Ind., where H. E. Fitch is superintendent. The unit is a Hough Payloader powered by an International diesel engine. Among the jobs it does are the following: cleaning up behind the stripping and loading shovels, removing dirt and spoil from the top of the exposed coal, as shown in the accompanying photograph, auxiliary loading to help out the loading shovel, moving heavy cables, transferring pumps and hose, and trenching for drainage. Blackfoot mechanics have equipped the Payloader's dipper with a shop-built hydraulic dumping device.

PARIS MANUFACTURING COMPANY

Announces

THREE *NEW* DRILLS

The PARMANCO Coal Drill will drill 2¼ inch holes at a speed of up to six feet per minute in #5 coal. Equipped with heavy duty truck-type transmission and rear end and a complete hydraulic feed, the drill is operated by one man from the control seat. It is made in two sizes with a 12 h.p. or 25 h.p. gas motor and all units are completely self-contained and enclosed in oil-tight cases.

ALREADY USED by

Big Bend Collieries, Inc.	1	Enos Coal Co.	1
United Electric Coal Co.	6	Southwestern Ill. Coal Co.	1
Fairview Collieries Corp.	2	Truax-Traer Coal Company	2
Colonial Coal Co.	1	Refractory Field	
Little Sister Coal Co.	1	Harbison-Walker Refractories Co.	1
Hume-Sinclair Coal Mining Co.	6	Mexico Refractories Co.	1
Sherwood-Templeton Coal Co.	1	A. P. Green Fire Brick Co.	1

THIS UNIT IS DELIVERING 6-INCH SHOT HOLES — READY FOR LOADING at Better Than Two Feet a Minute ! ! !

The new PARMANCO Hi-Speed Horizontal Drill is completely redesigned around a 40 h.p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time —a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

PARIS
MANUFACTURING
COMPANY
Paris, Illinois

FOR LEAKPROOF, TROUBLE-FREE PIPE RUNS

Specify Walseal* Products

On all types of piping jobs where Type "B" copper or red brass pipe is used, trouble can be avoided by installing Silbraz* joints — made with Walseal valves, fittings and flanges.

Threadless, patented Silbraz joints are silver brazed (not soft soldered) pipe joints that are leakproof, trouble-free — permanent . . . connections that will not creep or pull apart; that literally join with the piping system to form a "one-piece pipe line". Thus, these modern joints eliminate the need for maintenance and costly repairs — especially important where lowered operating costs are imperative.

For complete details on the modern Silbraz joint, made with Walseal products, write for a copy of Walworth Circular 84.

**Patented — Reg. U. S. Patent Office.*

Recommended for

- **Hot and Cold Water Circulating Systems**
- **Boiler Feed Lines**
- **Steam Return Lines**
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- **Low and High Pressure Air Systems**
- **Lubricating Oil Circulating Systems**
- **Industrial Gas Piping**
- **Solvent and Vacuum Piping Systems**

Make it a "one-piece pipe line" with WALSEAL

WALWORTH

valves and fittings

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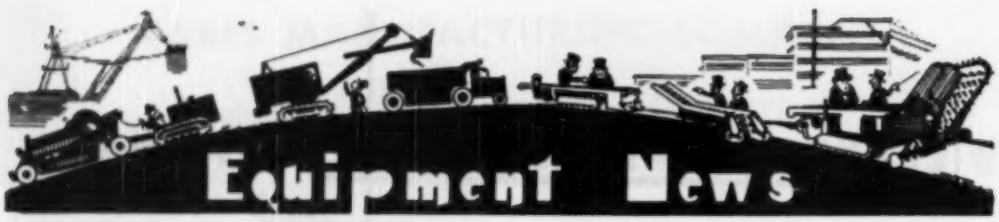
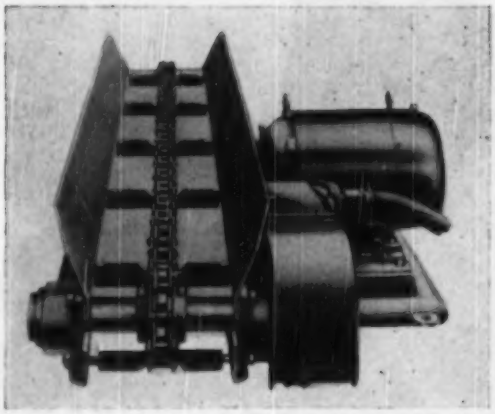


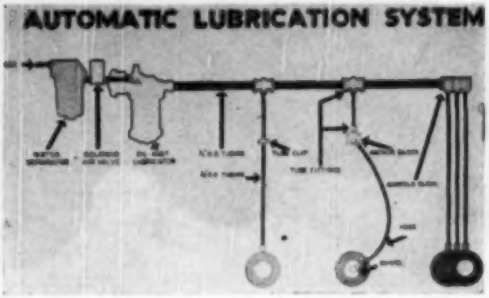


Chain-and-Flight Conveyors Feature New Design and Greater Movability (1)

Offering an entirely new design and several features for greater movability, new line of *Joy* room conveyors of the chain-and-flight type are available in three models, the 12-FA, 15-FA and 20-FA, with pan widths of 12, 15 and 20 in respectively. In the new drive design, the conventional herringbone reducer has been replaced by a helical and spur reducer said to be considerably more efficient, with building of the reducer into the discharge section permitting a reduction of about 5½ sq ft in the space required by the drive. The reducer's V-belt drive provides cushioned starting for the conveyor and is little affected by even substantial misalignment. For easy moving, the unit is said to be approximately 500 lb lighter than conventional conveyor drives. The drive breaks down into three parts, with the motor base mounted on skid bars and the discharge section equipped with a rounded base for easy barring or dragging. The units may be supplied in permissible or open construction, with flights spaced either for machine or hand loading, and three types of chain are available. Full details may be had from *Joy Mfg. Co., Pittsburgh* 22, *Pa.*

Low-Height Mining-Machine Haulers (2)

New series of track-mounted "Phil-Dollies" for hauling mechanical miners, loading machines, shuttle cars and other heavy mining equipment require a headroom of only 6½ in, have an over-all length of 11 ft and an 8-ft wheelbase. The 20-ton capacity model will handle the Joy Continuous Miner and all other modern mining equipment except the Jeffrey Colmol, for which a 35-ton model is available. Supplied for track gages from 36 to 56 in, Phil-Dollies are attached to mine locomotives by a tow bar with heat-treated coupling pins. The units are made of heavy-gage steel with Timken roller-bearings-equipped cast-steel wheels, and because of their low height will not tip over, the maker says. Full technical details are available.—*Phillips Mine & Mill Supply Co., Pittsburgh* 3.



Mist Lubrication Uses New Principle (3)

Newly announced Alemite "Oil Mist," a system of constant and automatic delivery of lubricating oil to all types of machines in "airborne" microscopic particles through tubing, is said to eliminate measuring devices and lubrication cycles, materially reduce oil consumption and increase machine efficiency. Hailed by the manufacturer as one of the most significant advances in lubricating methods in recent years, Oil Mist is reported to practically eliminate the human factor in lubrication, prolong bearing life, reduce bearing temperatures to permit stepped-up machine speeds and make down time for lubrication unnecessary. Coolant action is provided by the application of the correct amount of oil to prevent "fluid friction" and by the passage of air at slightly higher than atmospheric pressure, which also serves as protection against dust and abrasives on bearing surfaces. The Oil Mist lubricator attached to each machine is slightly smaller than the oil filter on an automobile, has no moving parts and utilizes only two controls. Performance data and technical details are available from *Alemite Div., Stewart Warner Corp., Chicago* 14.

No Matter What Your Job . . .

YOU'LL FIND some of the 56 new products and catalogs described in this section worth investigating. So as you check over these pages, note the numbers of the items that interest you. Then fill out the postage-free card facing p 124 and mail it to COAL AGE. We'll pass your request on to the manufacturers.

ADVERTISEMENT

NEW—Three-Point Rock Bit

Kennametal has recently announced the development of a new three-point rock bit. It has three blades of carbide, offers fast drilling speed and long bit life in sandstone, granite, hard limestone, and other similar rock. Primary advantage is the ability to drill ravelly ground and fast drilling speed.

●

Matthews, Moore Coal Co. Supt. Reports Bit Cost of .28 of One Cent

Mr. Claude Matthews, superintendent, Moore Coal Co., Devonia, Tenn., reports that heavy-duty Kennametal Bits have saved money on cutting time, machine repair, and bit costs. Seventy-five heavy-duty bits cut 2,400 places. Bit cost was reduced to .28 of one cent. A saving of 29% was made on power which lowered upkeep cost on mining machines.

●

New Jig Accelerates Bit Sharpening, Gives More Uniformity

A jig that frees machine bit grinders from hand sharpening has been developed. Advantages, other than easier operating, are faster and more uniform bit grinding and longer life for grinding wheels. Bits clamp in arms, and operator simply moves handle to get quick, accurate grinding.

Write for Bulletin M-106, Kennametal Inc., Latrobe, Pa.

●

Bit Developed for Shale, Slate and Boney Roof Drilling

A special bit for rotary drilling roof bolt holes in shale, slate, and boney has been developed. The bit, (RD Series) is a modification of the conventional coal bit. It is stubbier and stronger.

Write for Bulletin M-105. Kennametal Inc., Latrobe, Pa.

FREE! New Booklet on Cutting and Drilling

A new catalog that gives the latest information on how to cut and drill coal more efficiently with carbide bits has been published by Kennametal Inc., Latrobe, Pa. Twelve NEW tools are described and illustrated. They are bits for roof bolting, three-point rock bits for drilling rock, hitch bits for drilling holes for timbers, pinning rods for standard coal drills, a new grinding jig for sharpening bits, a revolutionary bit that is set with mining machine bits (it rotary-drills solid rock), and a short-pronged bit that gives maximum rotary drilling efficiency in medium hard rock.

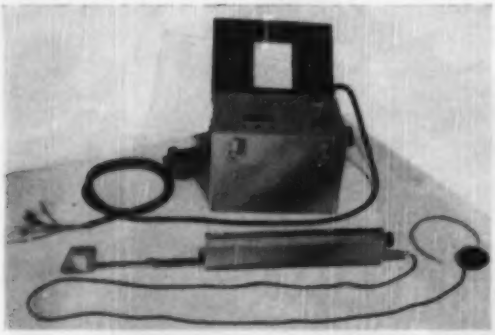
The thirty different tools are offered in nearly 400 different sizes and complete data on performance and servicing is given. The Kennametal catalog is an almost indispensable aid to those interested in modern and efficient methods of cutting and drilling coal with carbide bits.

Your copy is available free—write today! Kennametal Inc., Latrobe, Pa.

KENNAMETAL®

DRILL BITS • MACHINE BITS • STRIP BITS • ROCK BITS

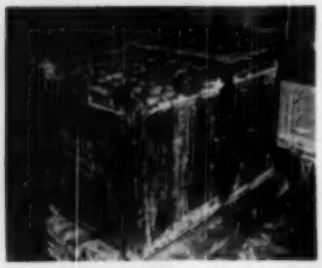
Specialist in Coal Cutting and Coal Drilling with Cemented Carbide Tools



Cable Fault Finder Simply Operated (4)

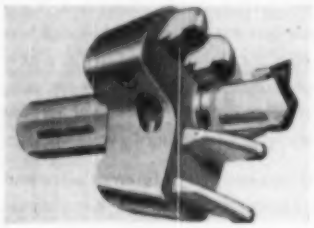
New Joy M-70-M fault finder, said to permit quick location of short circuits and open-type faults in cables, requires no technical training or complicated calculations to operate. The lightweight transmitter and receiver are designed to operate on batteries and require no external power connections. In use, the operator carries only the lightweight "wand-like" receiver and earphones (front, in photo). Bulletin F-28 gives a full description of the unit available from *Mines Equipment Div., Joy Mfg. Co., St. Louis* 10, *Mo.*

ONE OF THE 56 NEW PRODUCTS or catalogs described in this section might save you real money. Use the card facing p 124 if you want more data.



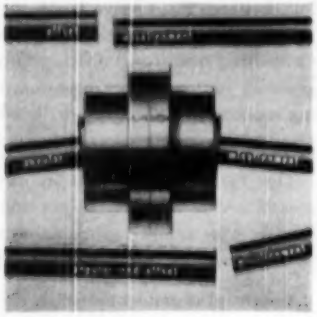
Coating Prevents Battery-Tray Corrosion (5)

New coating for steel battery trays developed during World War II has been proven in extensive tests to offer high resistance to corrosion from the small amounts of acid that may accumulate on the outside of batteries, Exide engineers report. Typical test example is the treated battery (left, above) after 2-yr service, compared with asphaltum-painted battery (right) shown after 3-yr service. If under unusual circumstances, the tray is scraped, corrosion is limited to the bare steel surface exposed as a result of the tight bond formed between the coating and metal surface, it is reported. The coating also will not flake off if hit or subjected to abrasion and its high insulating quality protects the steel trays from corrosion resulting from current leakage, the manufacturer says. Full details may be had from *Electric Storage Battery Co., Philadelphia* 32.



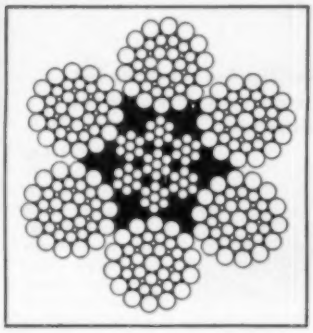
Rotary Rock Bit (6)

Designed for more efficient and economical rock boring, with less bit changing, new Kennametal UD bit features a bit head made of a heavy cast-steel section in which Kennametal tungsten-carbide-tipped mining-machine bits are secured by set screws. When dull, bits are easily removed for resharpening. Made for 6½-in blastholes, the bit drills at a rate of 3½ in per minute in solid rock to about 3 ft under average conditions, the manufacturer reports.—*Kennametal, Inc., Latrobe, Pa.*



New-Design Couplings (7)

New Ajax Dihedral coupling, designed to handle angular and offset misalignment up to 7 deg with a standard coupling and up to 12 deg with a special model, is based on a Dihedral tooth shape which provides for maximum misalignment with minimum clearance or backlash, the manufacturer reports. Among the economies the new Ajax Dihedral coupling offers, according to the maker, is time saved in lining up equipment, simplified machine design by eliminating necessity for precision alignment of driving and driven shafts, elimination of most alignment problems caused by normal bearing wear, old or inadequate wooden floors, weaving chassis or structural mountings created by temperature changes, settling or heaving foundations and other conditions. Complete details in Bulletin 50 from *Ajax Flexible Coupling Co., Inc., Westfield, N. Y.*



New-Type Wire Rope (8)

Two new Roebling wire ropes designed for hoist duty on medium- and large-size shovels and draglines, the 6x43 and 6x49, feature uniform small-size inside strand wires for maximum flexibility, handling ease and operating efficiency, combined with large outside wires that provide resistance to wear, tear and abrasion. In performance tests during the past 2 yr, the maker reports, yardage excavated averaged over 35% more with the same equipment and conditions, while down-time for rereeving was 25% less.—*John A. Roebling's Sons Co., Trenton 2, N. J.*

Switchboard Units (9)

New line of custom-built pre-engineered switchboards called Centr-A-Power is designed to centralize power

(*Continued on page* 120)

Stand-Up Stamina

SUSTAINED EARNING POWER—*that's Mack*

• Wherever there's earth or rock to be moved...wherever there's need for *extra* performance, *extra* stamina, *extra* dependability—there you'll find a job that's made to order for a Mack.

Mack's proved superiority in earth moving work rests on *built-in superiority* of design and construction. In addition to their inherent power, strength and durability, Mack trucks bring you outstanding advances in maneuverability, ease of control, positive traction and maintenance accessibility.

Follow the lead of profit-wise operators who have discovered from actual experience that when it comes to working harder, lasting longer and operating at lowest cost—there's nothing to equal a Mack. Your nearest Mack branch or distributor will give you the full story on what Mack's *sustained earning power* can mean to you in greater profits through greater output at lower cost.

Be Profit-Wise

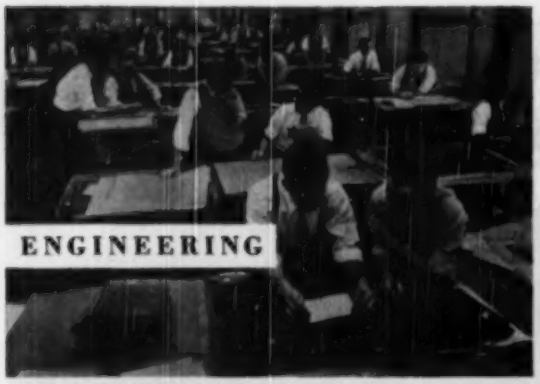
Modernize with

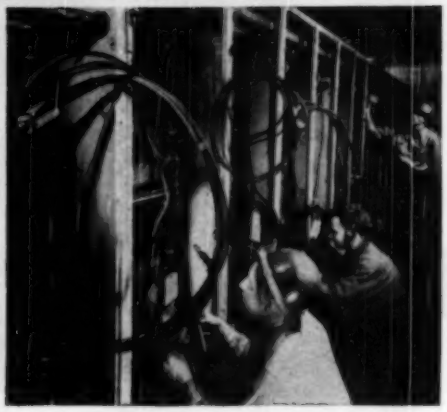
Mack TRUCKS

0418

...outlast them all

Mack Motor Truck Corporation, Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.





You Get More

In a Roberts and Schaefer Preparation Plant!

In a coal preparation plant engineered and constructed by Roberts and Schaefer Company you get more than the materials involved, more than the visible structure and machinery.

The important *extras* you get are the priceless R&S experience in creating completely new plants and modernizing obsolete plants . . . and the broad R&S engineering, construction and manufacturing facilities. In Roberts and Schaefer Company you find an organization equipped to do the whole job or any part of it . . . any place in the world . . . any time you are ready.

Next time you have a coal preparation problem, remember that you get more for your investment when you get in touch with R&S.

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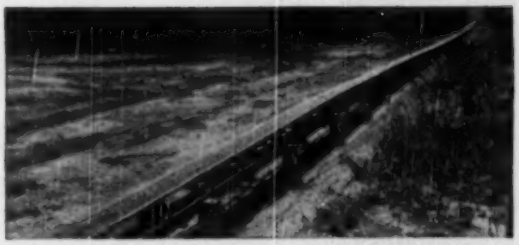
FOR HEAVY DUTY CONVEYORS . . .



This 1¼ mile Continental Gin conveyor system equipped with Timken bearings has handled stone at the rate of 300 TPH for over nine years without a bearing replacement.

1200 foot Stephens-Adamson conveyor has 2000 ton per hour capacity. Uses 42 inch belt at speed of 500 feet per minute. Has Timken bearings in idlers.

This coal-carrying conveyor, built by Jeffrey Mfg. Co., has Timken tapered roller bearings in the idlers for long life, minimum maintenance.

AND HERE ARE SIX BIG REASONS WHY:

REASON NO. 1. *Thoroughly proved.* Every heavy-duty conveyor installation using the popular dead shaft tapered roller bearing construction with fifteen years or more service is equipped with Timken® tapered roller bearings. REASON NO. 2. *Extra capacity.* Due to line contact between rollers and races, Timken bearings have high load capacity. And because of Timken's tremendous industrial and automotive bearing production, which results in low unit cost, it is economical to select bearings with capacity in excess of actual requirements. REASON NO. 3. *Long-life lubrication.* Not just lubricated for "life" (which could be short) but lubricated periodically as conditions require to insure *long* life. REASON NO. 4. *Friction minimized.* Timken bearings roll freely. Fresh lubricant at regular intervals means no gummy, jammed bearings. REASON NO. 5. *Longer roller and belt life.* Less sliding and scuffing between idlers and belt. REASON NO. 6. *Maintenance reduced.* Timken bearings insure long, trouble-free service, with a minimum of maintenance for the entire conveyor installation.

Remember, the word "Timken" is not a bearing type but a trade-mark applying to bearings made only by The Timken Roller Bearing Company. Always specify Timken bearings in conveyors. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

Wherever the going's tough industry turns to

TIMKEN

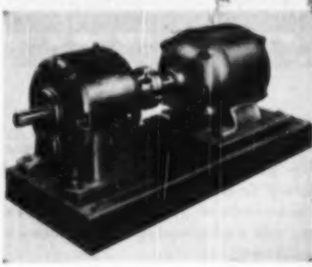
TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

Typical applications of Timken bearings for conveyor idlers.

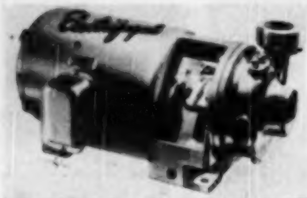
NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL AND THRUST ← LOADS OR ANY COMBINATION

and lighting switching in one dead-front free-standing package. Centr-A-Power consists of a series of vertical rigid steel troughs connected by a continuous power line, into which all types of switching devices are inserted, with each unit mechanically and electrically isolated from the other. The standard 18-in trough mounts circuit breakers up to 600 amp and fusible switches up to 200 amp, 600-v maximum. Two larger-size standard sections of 22- and 28-in widths are available for fusible devices up to 1,200 amp and for circuit breakers up to 1,600 amp. Standardized design is said to offer construction and installation economies, with operation, maintenance and inspection facilitated by quick-clip self-aligning design of the units that make removal or replacement little more than a simple hand operation. Bulletin TEB-10 giving detailed information may be requested from *Merchandising Div., Trumbull Electric Mfg. Co., Plainville, Conn.*



Packaged Power Units (10)

New packaged power unit, called Link-Belt Motogear, consists of a compact enclosed helical gear drive with separate standard motor, flexibly coupled and mounted on one welded-steel base plate. A movable plate between motor feet and welded base plate permits convenient adjustment for shaft realignment if necessary. Link-Belt Motogears are built in various sizes, in double or triple reductions, and in a wide range of ratios and horsepowers. Input and output shafts are concentrically in line. The helical gear drive also is available as a separate self-contained unit without the motor. Complete information on gearmotors, motogears and separate helical gear drives, 1 to 75 hp, is given in a new 16-p Book 2247 available from *Link-Belt Co., Chicago 1.*



Pump-Motor Unit (11)

A redesigned close-coupled Electrifugal pump and motor with internal and external design changes to provide improved operating characteristics and greater ease in maintenance, is available in ratings of 10 to 500 gpm, at heads to 220 ft, with motors ¾ to 10 hp, according to the maker. The improved unit features new sealed motor bearings, a unit-cast frame which provides perfect and permanent alignment, double seal on front motor bearing, and a large opening in the frame between the pump and motor for speeding packing maintenance. Utilizing an all-cast-iron construction that resists corrosive atmospheres, the pump is available with removable casing in some sizes and with removable cover plate in others. Motors are available in drip-proof, splash-proof, totally enclosed fan-cooled or explosion-proof types. Bulletin 52B6140B gives full details.—*Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

Pressure Blowers (12)

Moore Class 2000 axial-flow pressure blowers are designed and constructed as a complete unit, including the special direct-drive motor mounted within the hub and housing and are tailor-assembled for any of varied performance requirements. From standard parts, a unit of given diameter with from two to nine blades, set to the proper angle, may be provided for peak efficiency at the specified performance, the maker says. The Moore direct-drive slow-speed motors, designed for fan-and-blower drive with low starting current and low-starting torque characteristics, achieve considerably higher efficiencies than conventional all-purpose motors, it is said. Guaranteed for 5 yr, Moore Class 2000 units are available in two size ranges: Series 16, in diameters from 3 to 5 ft; Series 24, in diameters from 4 to 8 ft; in any voltage to 550; one, two or three phase; 25, 50 or 60-cycle frequency. Belt-drive units also are available. Engineering Data Booklet TMC-171 provides full details.—*The Moore Co., Marceline, Mo.*

Speed Reducers (13-16)

Newly improved Falk speed reducers designed for wide variety of power-transmission requirements include standard units featuring precision-cut herringbone double helical gears and are available with sleeve bearings or roller bearings. Falk right-angle speed reducers are furnished with spiral-bevel precision-cut helical gears and the vertical right-angle units are equipped with a Falk patented oil pump said to assure positive lubrication at all times. Right-angle units are equipped with anti-friction bearings. All units have input speeds up to 1,750 rpm, or higher if necessary. Separate bulletins offering detailed information on each type are available from *The Falk Corp., Milwaukee 8, Wis.*, as follows:

Parallel-shaft speed reducers (sleeve bearing): Ratio from 2.22:1 to 300:1, 15 to 2,000 hp—Circle No. 13 on postage-free card.

Parallel-shaft units (roller bearings): Ratio from 2.22:1 to 300:1, 15 to 1,500 hp—Circle No. 14 on card.

Right-angle vertical speed re-
from 1.5:1 to 515:1, 15 to 1,500 hp—Circle No. 16 on card.

Right-angle horizontal units: Ratio
ducers: Ratio from 5.7:1 to 430:1, 15 to 1,500 hp—Circle No. 15 on card.

Low-Voltage Breakers (17)

Allis-Chalmers Types G-25 and G-50 low-voltage air circuit breakers, previously available only as bare

Coal gravities from 1.35 to 1.65 . . . sizes as large as 10" or as small as ⅛" . . . compositions with widely varying percentages of discards! You can successfully meet *all* these requirements with the Chance "heavy density" Sand Flotation Process, noted throughout the industry for having a very high degree of flexibility. In addition, you get:

High separating efficiency — great recovery of salable coal, close to 100%. Also, from a single Chance Process unit you can obtain a low ash product, medium ash product, and a reject product.

Most dependable performance — steady, uniform, trouble-proof operation. Specific gravity of mixture remains constant; efficiency of separation is unaffected by fluctuating loads or changing qualities of coal.

Simple operation — Change-over from one washing gravity to another can be made in five minutes, simply by opening or closing valves . . . all under one-man control.

Cut coal-cleaning costs, get more salable coal, and earn top market prices with the aid of the Chance Process. Our engineers will be glad to cooperate with you in solving any of your coal-cleaning problems.

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breakers or in metal-enclosed switchgear, can now be had for individual mounting. The units have a sheet-steel enclosure formed and welded into a housing that completely encloses the circuit breaker and cable connections. Design provides for easy removal of covers and speedy connection, it is said, and weather-proof units are completely rubber-gasketed. Particularly effective where frequent operation is expected, the manufacturer says, the breakers are suitable for protection of lighting loads and small transformers, across-the-line starters, as back-up protection for motor starters, and as main feeder breakers on systems which have ac voltages of 600 and below, fault currents of 25,000 and 50,000 amp, and continuous currents from 35 to 1,600 amp.—*Allis-Chalmers Mfg. Co., Milwaukee* 1, *Wis.*

U-Shaped Dozer Blade (18)

New No. 8U bulldozer, designed for universal use in a variety of earth-moving applications with the Caterpillar D8 diesel track-type tractor, features a U-shaped design that permits long-haul pushing of loose material with minimum end spillage when bulldozing straight ahead and reportedly is particularly adaptable for stockpiling and handling large-capacity loads. The complete unit is cable-controlled and the blade has a cutting width of 11 ft 11 in.—*Caterpillar Tractor Co., Peoria* 8, *Ill.*

Equipment Shorts You'll Want to Check

(19) CONVEYOR-BELT REPAIR—Anti-abrasion "Magic-Vulc" plastic rubber and primer reportedly can be applied by unskilled workers to worn or damaged belting, or for sealing edges or rivet holes, thus providing increased resistance to abrasion and eliminating shrinkage and decay from moisture seepage. Magic-Vulc also is effective for coating valves and pipes and lining chutes, the maker says. Details and trial unit available from *Magic Chemical Co., Brockton* 2, *Mass.*

(20) MAINTENANCE TOOL—With a twist in the desired direction and a few raps with a hammer, screws, bolts or nuts can be tightened or loosened easily and quickly with a new simple hand tool named the "Impakdriver," the manufacturer states. Utilizing a cam principle that translates the impact from a hammer's blow into effective torque, the tool is particularly useful for starting stubborn nuts, bolts or screws that are rusted or frozen on, for working in hard-to-get-at places and, reportedly, will save time for anyone who uses a wrench or screwdriver. Bulletin shows applications and prices.—*H. K. Porter, Inc., Somerville, Mass.*

(21) BOW SAW—"The Miner," a new type of Swedish bow saw designed for cutting timbers, logs and other rough work, has a narrow, tapered, frictionless Swedish steel blade said to cut up to a third faster than a one- or two-man saw. Handy tension lever permits quick changing of blades and high tension when in use, and new blades cost less than the usual sharpening of the wider-blade two-man saw, the manufacturer says. Prices and literature from: *Gesco Tool Div., General Steel Warehouse Co., Inc., Chicago* 39.

(22) CRAWLER TRACTOR—Terra-trac, powered by a 4-cyl Continental gasoline engine, provides over 20 drawbar hp or 25 belt hp and exerts over 3,000 lb pull in first gear, the maker says. The unit features a track gage from 36 to 72 in and hydraulic operation of such attachments as bulldozers, loaders, winches, earth drills, cranes and snow plows.—*American Tractor Corp., Churubusco, Ind.*

(23) ELECTRONIC SMOKE ALARM utilizing a photo-electric cell and sensitive amplifier is said to provide protection for areas up to 200x30 ft per unit, with one puff of smoke actuating any type of signaling device desired. Small holes drilled in beams or partitions permit use of the units in almost any type of buildings. Adaptable also as a burglar alarm, the Safe-Eye Smoke Alarm features low power cost and economical first cost, the maker states. Bulletin available from *Valley Forge Safe-Eye Alarm Service, Valley Forge Rd., R. R.* 1, *Lansdale, Pa.*

(24) MOLYBDENUM-BASE LUBRICANT recently introduced now is available in four new forms to meet specific application needs. In its seven present forms, the lubricant permits safe lubrication at higher machine speeds, pressures and temperatures than ever before possible, the manufacturer states. Technical Bulletin 21-E, giving full details of properties and application, is available from *Lubricants Div., Lockrey Co., College Point, N. Y.*

(25) FREE-RUNNING DRAGLINE DUMP BLOCK is said by the manufacturer to help cut the machine digging cycle, with the block sheave turning on an oversize roller bearing

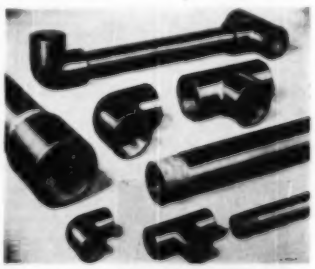
to give full dumping force to the bucket load when its dragline is slacked off. To prevent fouling or fraying of the fast-moving dump line, the housing throat is faired into the sheave ropeway, with the rope confined and cradled to assure positive seating at any rope tension.—*Baer Steel Products, Inc., Auburn, Wash.*

(26) FLAT-TOP CARBIDE BIT recently added to the line of Crown carbide Rok-Bits is a tungsten-carbide bit of the conventional flat-top type, recommended by the manufacturer where limited budgets are involved. With its addition to the line, a wide range of bit types covering practically any application is available from *Rock Bit Sales & Service Co., Philadelphia* 25.

(27) ALL-PURPOSE WORK GLOVE has a wing-type all-leather "Dura-Thumb" that features one continuous seam on the back of the thumb to secure longer glove life by eliminating stitching at the point of greatest stress—where thumb meets palm. Available in either gauntlet or safety-cuff types from *Richmond Glove Corp., Richmond, Ind.*

(28) SOCIAL SECURITY AND WITHHOLDING TAX CHARTS, issued by *Delbridge Calculating Systems, St. Louis* 17, *Mo.*, have been revised for new withholding taxes due Oct. 1. The charts feature a series of tables arranged on a hinged-card visible index that eliminate calculations and are available for various payroll periods at $3.50 each.

(29) IMPROVED LIFTING MAGNET added to the Dings line of magnetic equipment can be used on overhead or crawler cranes to hoist, load and handle all types of magnetic materials and is available in five diameter sizes, 29, 39, 45, 55 and 65 in. Catalog B-1401-A gives information on lifting capacities, power-consumption ratings and dimensions.—*Dings Magnetic Separator Co., Milwaukee* 46, *Wisc.*



(30) NEW PLASTIC PIPE furnished in threaded sections, together with molded plastic fittings which facilitate installation of standard or intricate systems for handling fluids or gases, is designated CARLON "TL" and incorporates standard International pipe threads. Available in ¼-

to 2-in sizes and in 20-ft lengths, Carlon TL can be threaded and cut in the conventional manner with standard pipe-fitting tools, and features extreme light weight, ease of cutting and make-up and complete immunity to rot, rust and electrolytic corrosion.—*Carlon Products Corp., Cleveland 5, Ohio.*

(31) SET-SCREW-TYPE WIRE CONNECTOR, approved for 600-v application and as a pressure cable connector for general use in all branch-circuit wiring, is recommended by the maker for use on conduit, armored cable, nonmetallic cable and open wiring. No solder, tape, or special tools are required for installation; the joint can be easily inspected, and the unit is readily unscrewed and reused. Bulletin J-3 from *Ideal Industries, Inc., Sycamore, Ill.*

(32) RECORDING INSTRUMENTS—New line of Series 500 Strip-Chart Dynamaster electronic instruments offers various models of a high-speed, self-balancing ac bridge designed for measurement of temperature, resistance, strain, position, inductance, pressure, force, or any other variable which can be measured in terms of impedance. Automatic controllers, including both electric-operated types and Free-Vane pneumatic types, are available. Bulletin W-1821 offers full details.—*Bristol Co., Waterbury 20, Conn.*

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(33) TACHOMETER — High-speed electronic counter tachometer, for high-accuracy revolution and frequency measurements, can be used to measure frequencies up to 100,000 cycles per sec with an accuracy of plus or minus one cycle, it is said. It is intended for use on high-speed turbines, engine motors, *etc.*—*Potter Instrument Co., Great Neck, N. Y.*

EQUIPMENT BULLETINS — Use Postage-Free Card Above To Add These Helpful Catalogs to Your Working File

(43) WOOD PRESERVATIVE—Technical data available from *Cuprinol Div., Darworth, Inc., Simsbury, Conn.*, offers detailed information on application and performance of Cuprinol water-repellant wood preservative for dip-treating lumber for protection against rot, termites, warping and swelling. Separate folder covers "Sav-It," another Cuprinol product said to be especially useful in repelling water and preventing mildew on canvas, leather and fabrics.

(44) SELENIUM RECTIFIERS—Clark Electronic Laboratories, Palm Springs, Calif., offers Bulletin 122 illustrating and describing the features, application and design of its line of Celab selenium rectifiers. Bulletin 123 covers the company's line of Celab electronic power switching tubes, interrupter tubes, circuit breakers, reclosing breakers and capacitor switching.

(45) SHORTWALL CUTTING MACHINES—Catalog 829 available from the Jeffrey Mfg. Co., Columbus 16, Ohio, offers detailed construction and operating data on the various Jeffrey shortwall cutters, the track-mounted self-propelled Handitruck and rubber-tired truck for transporting the units and other cutter accessories. Application and design features are thoroughly described and illustrated.

(46) DRYING SYSTEMS—Catalog 54-FD features 26 p of detailed data on the design, operation, and features of the C-E Raymond Flash-Drying systems. Illustrations include flow-sheets showing various arrangements for typical applications in the removal of moisture and reduction of material to a uniformly fine dry product.

(47) CENTRIFUGAL-PUMP SELECTION GUIDE, issued by Allis-Chalmers Mfg. Co., Milwaukee 1, Wis., contains detailed data on a wide variety of pumping units, including close-coupled, pedestal, double-suction single-stage, multi-stage, self-priming, fractional-horsepower, coolant and circulating, fire, solids handling, rubber-lined, etc. Head capacity charts and tables for the various types, along with data on sizes, capacities and construction features, are covered in this 16-p booklet, Bulletin 52B6059G.

(48) RUST-PREVENTIVE OILS—Booklet from Sun Oil Co., Philadelphia 3, describes Sunvis H.D. 700 oils, which are said to keep machines clean, prevent rusting, withstand heavy bearing loads, provide long service life, not foam and simplify inventories. The booklet covers performance of these heavy-duty oils in circulating and hydraulic systems, compressors and gear boxes.

(49) CUTTING AND DRILLING BITS—Catalog M-6 issued by Kennametal Inc., Latrobe, Pa., covers nearly 30 styles of tungsten-carbide-tipped tools used to cut and drill coal and rocks, with nearly 400 different sizes offered. The new catalog outlines performance data on the major lines for cutting and drilling coal, drilling roof-bolt holes and drilling rock, and also discusses the company's engineering and manufacturing facilities.

(50) 10-TON DUMP TRUCK—Euclid Road Machinery Co., Cleveland 17, Ohio, has just released a new Catalog 151, on the Model 1UD rear-dump Euclid, which is powered by a 125-hp diesel engine and has a payload capacity of 20,000 lb. The 8-p catalog describes the model in detail, with specification data.

(51) POWER AND CONTROL CABLE—New 60-p catalog available from Rome Cable Corp., Rome, N. Y. incorporates the latest specifications approved by the Underwriter's Laboratories and is designed as a handy guide for easy selection and specification. It offers complete technical data,

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descriptions and recommended uses for all Rome cables and also covers insulations, their applications, approved shielding practices, special power problems and test data.

(52) METALLIZING—Bulletin M-8,-000 describes the Metalweld process for mechanical repairs and protection of surfaces against corrosion and contamination, along with details of application, procedure and results. Metalweld, Inc., Philadelphia 29.

(53) CENTRIFUGAL PUMPS—Bulletin CP-749B, issued by Mission Mfg. Co., Houston 14, Texas, covers operation and application of the Mission line of centrifugal pumps featuring the Sherser hydraulic principle and streamlined flow from concentric casings, which is said to offer sustained efficiency under adverse conditions, longer abrasive service and reduced vibration.

(54) BEARING LUBRICATION—"It isn't necessary to lose time due to bearing failures—they don't occur when you have the proper lubrication . . ." says Trabon Engineering Corp., Cleveland 3, Ohio, in a 12-p booklet covering the Trabon oil and grease systems. Application of Trabon systems can greatly reduce repair costs, cut power bills and eliminate the hazards of hand lubrication, the bulletin maintains.

(55) CENTRIFUGAL PUMP—Bulletin 1001 contains a complete description, cross-section drawing, rating tables and dimension prints of the new Type GS pump built in three sizes from 2½ to 4 in, for capacities to 400 gpm and heads to 230 ft. To fit the DeLaval service and exchange plan, all parts of the GS pump except the bare pump casing are contained in one easily replaceable rotor assembly, which can be easily removed and is credited on purchase of a new one. Available from DeLaval Steam Turbine Co., Trenton 2, N. J.

(56) EXCAVATOR—Bulletin 400, just released by Marion Power Shovel Co., Marion, Ohio, describes the construction, operation and features of the Marion Type 43-M machine, an all-purpose 1-cu yd excavator. The new bulletin lists and illustrates the Marion 43-M's varied applications as a shovel, dragline, clamshell, crane, backhoe and pile driver.

(57) HARDFACING ALLOYS—New 20-p catalog contains detailed information on the complete Airco line of hardfacing alloys and includes typical uses, mechanical properties, chemical analyses and a brief outline of recommended procedures. Available from Air Reduction Sales Co., New York 17.

(58) HEAVY DUTY PORTABLE CONVEYOR—Bulletin 374 describes the complete range of the Barber-Greene Model 374 heavy duty portable conveyor and covers operation and products handled, construction features, applications and accessories such as feeders, screens, hoppers. The units have a capacity of 150 to 425 tph, with belts 18, 24 or 30 in wide.

(59) SPEED REDUCERS—Bulletin 130 issued by Cleveland Worm & Gear Co., Cleveland 4, Ohio, is a 36-p booklet offering detailed information on its Type AT and RT worm-gear speed reducers. Included are full rating tables, dimension tables and drawings, plus detailed construction and operating data on the newly improved units.

(60) FIRE-FIGHTING FUNDAMENTALS—Ansul Chemical Co., Marinette, Wis., makes available an educational booklet on fire suitable for distribution to fire-protection personnel. The 4-p booklet, "Fundamentals of Fire Extinguishment," offers an illustrated discussion of what fire is, classes of fire and methods of extinguishment.

(61) FLEXIBLE METAL HOSE—Catalog 500 available from Atlantic Metal Hose Co., Inc., New York 23, prepared for design and maintenance departments, covers flexible metal interlocking high-pressure hose, air-jacketed hose for diesel exhausts, conveyor hose for ventilating and exhausting, flexible metal seamless high-pressure hose and diesel-exhaust hose, metal-lined gasoline hose and synthetic-rubber gasoline hose and various couplings.

(62) HYDRAULIC OILS—The importance of using the correct hydraulic oil to obtain higher production speeds, precise control, and longer operation is stressed in a new booklet prepared by Sun Oil Co., Philadelphia 3. It contains concise descriptions of Sun's hydraulic oils and recommended applications, with a chart showing their useful life characteristics in relation to time and temperature.

(63) DUST AND FUME CONTROL—Bulletin 282, "American Dustube Dust and Fume Collectors in the Mining and Metallurgical Industries," describes the operation of cloth-tube-type collectors employed in recovering values in gases from roasters, sintering machines, induction furnaces, etc. A wide selection of filter fabrics, including new synthetics, has increased the scope of cloth filtration so that hot and/or corrosive gases may be efficiently and economically handled, it is reported, with uniform recoveries in excess of 99% by weight. Available from American Wheelabrator & Equipment Corp., Mishawaka, Ind.

(64) LUBRICATION—"The Brooks Oil Story," published by Brooks Oil Co., Pittsburgh 12, Pa., shows the manufacturing techniques and production facilities of the 74-yr-old grease and oil-compounding firm arranged as a picture tour. Included are details on a variety of Brooks Leadolene Klingfast products, plus information on the planning procedure, research and development facilities and case histories of product performances in various industries.

(65) LIFT-TRUCKS—Bulletin M-410 prepared by Mobilift Corp., Portland 14, Ore., illustrates Mobilift's two new 2,000-lb capacity Lev-R-Matic Drive Fork Lift Trucks and gives specifications and detailed data on the operation and features of both models.

SUNVIS SLASHES DOWNTIME

Sticking Valves and Rings, Blow-by, Crankcase Dilution, Bearing Failures—All Are Practically Eliminated

A coal mining company, working six strips at one time, kept 26 bulldozers operating continuously on a three-shift schedule.

The dozers lost efficiency from inadequate lubrication. Frequent oil changes did little to correct sticking valves and piston rings, blow-by in the cylinders, and consequent crankcase dilution. Bearing failures occurred frequently and every shutdown of a dozer cost two full days of its production.

After experiencing the same poor results with two different oils, the company consulted a Sun representative, and on his recommendation turned to the use of a heavy duty Sunvis Oil. Marked improvements were immediately achieved. Freedom from hard carbon keeps valves and rings operating efficiently. Blow-by is no longer a problem. Crankcase dilution has been minimized so that oil change periods are now safely extended. Bearing failures due to faulty lubrication have been done away with. Production goes on according to schedule, and operating costs are much lower.

You owe it to yourself to investigate the remarkable properties of Sunvis Oils. *They're good for the life of your machinery.*

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New Wage Drive Hinted; Welfare Fund Adds Benefits

COAL OPERATORS in October scanned with mixed feelings and some wariness three developments on the labor front—hints that the UMWA will seek an early reopening of the wage agreement, transfer of District 50 mine-construction workers into the parent union and announcement of new disability aids in the Welfare & Retirement Fund.

The hint of possible new wage demands came Oct. 14, when John Mates, member of the UMWA International Board, told the Shenandoah Mine Board "unofficially" that the union is studying the possibility of reopening the present anthracite contract. Though he gave no reasons, it was felt generally that the cost-of-living rise since Korea plus recent wage grants in other industries might spur a move by the UMWA in anthracite and bituminous.

A flurry of excitement accompanied revelation Oct. 13 of a letter dated Oct. 9 from a UMWA district president to operators within his area. The letter served notice that the UMWA Executive Board had voted to "take jurisdiction over all construction work in and around coal mines, or in connection with the production or preparation of coal or coke, or in the sinking of shafts or slopes, or the driving of tunnels, including repairs and maintenance on company houses, plants and buildings."

To some operators and officials of AFL building trades organizations, the letter sounded like the opening of a jurisdictional battle. A UMWA spokesman, however, pointed out that the union intended only to transfer 1,500 to 2,000 construction workers from District 50, the UMWA catch-all organization, to the parent union. This move would enable construction workers to dip into the welfare fund and, besides simplifying bookkeeping, would free District 50 for organizing other industries. At its recent meeting, the AFL had accused District 50 of tactics "akin to strikebreaking."

The new disability aids, announced Oct. 13, were set up to replace the disability program that was abandoned when the welfare fund collapsed in 1949 and are in addition to death benefits, pensions and hospital and medical services. With eligibility rules tightened, the main provisions of the new program are:

1. Disabled miners 45 to 60 yr old and younger men disabled for at least 5 yr—$30 a month with $10 more for each dependent child under 18 or incapacitated person living with the miner.

2. Miners' widows more than 50 yr old—$30 a month with $10 additional for each dependent child under 18 or incapacitated person; widows under 50—$30 plus $10 for each child. There is no provision for cash benefits for widows under 50 without children. Regular income from other sources is deductible from the benefits.

3. Adult dependents of living miners—hospital service limited to 60 days per year.

4. Widows and dependent children will get the same hospital and medical services now provided for UMWA members, their wives and children under 18.

Supreme Court Will Rule on Liability for Seizure Costs

The Supreme Court has agreed to review the decision of the U. S. Court of Claims holding the government liable for increased costs incurred by Peewee Coal Co., Knoxville, Tenn., when the government seized its mines May 1, 1943. At that time the government granted $30 per year increased vacation pay and required the operators to pay for lamps.

The Court of Claims awarded the company $2,241.26 in compensation, including $1,890 in vacation payments and $451.26 refunded to the miners for lamp rentals. The court refused the company claims of $36,128.26 because the losses were not attributable to government action.

Federal attorneys, asking the Supreme Court to reverse the Court of Claims, pointed out that the decision will have a great effect upon the future use of seizure powers for controlling strikes in critical industries. If the government is liable for increased costs, they argued, it will hesitate to put seizure legislation into effect for fear of incurring liabilities amounting to "scores of millions." The seizure in May, 1943, also affected 2,850 other mines, and 103 Midwest truck-mine companies in another wartime seizure also are seeking damages.

Ireland Named President Bituminous Coal Institute

R. L. Ireland, chairman of the executive committee of The Hanna Coal Co., was elected president of Bituminous Coal Institute at a meeting of the board of directors held in New York Sept 20. Mr. Ireland, formerly a vice president of the organization, succeeds Fred S. McConnell, president of the Enos Coal Mining Co., who had asked to be relieved.

D. W. Buchanan Jr., president, Old Ben Coal Corp., was elected BCI vice president. Retained in office by the board were: treasurer, Ralph H. Knode, president, Stonega Coke & Coal Co.; secretary, John D. Battle, NCA executive vice president; and director of public relations, Ralph C. Mulligan.

In accepting his resignation, the board paid personal tribute to Mr. McConnell and gave him a sincere vote of thanks on behalf of the entire industry for his leadership and guidance in building the industry's public relations. Mr. McConnell continues as a member of the BCI board.

I. N. BAYLESS (left), president, The Union Pacific Coal Co., accepts the Sentinels of Safety Trophy on behalf of Reliance No. 7 mine for the second consecutive year. J. I. Horty (right), editor, The Explosives Engineer, makes the presentation as A. E. Stoddard, president, the Union Pacific R.R., looks on. At the right is a partial view of the presentation dinner given to honor Reliance miners and their wives.

Union Pacific Fetes Miners and Wives

EMPLOYEES of Reliance No. 7 mine, The Union Pacific Coal Co., and their wives, were honored at a dinner given by the company Sept. 22 at the Old Timers Bldg., Rock Springs, Wyo., in recognition of their nationally outstanding safety record.

The award of the Sentinels of Safety Trophy by the U. S. Bureau of Mines in conjunction with *The Explosives Engineer* magazine for having worked 386,750 man-hours during 1949 without a single lost-time accident marked the 11th win for the Union Pacific Coal Co. during its 17th year of participation in the national competition. It was the second consecutive year that the mine had worked without a lost-time accident and won the top honors in the bituminous group. In accepting the trophy, I. N. Bayless, company president, pointed out that "Reliance is well on its way for the third consecutive win, not having a single lost-time accident so far during the year 1950."

A. E. Stoddard, president of the Union Pacific R. R., was introduced by Mr. Bayless. After complimenting the miners and their families on their outstanding record and emphasizing the importance of the mines to the parent company, Mr. Stoddard called for greater use of coal throughout the nation. "I sincerely hope that you will see the time—not because of the Korean war or any other war—when coal will be back in its own, insofar as fuel is concerned, in this nation," Mr. Stoddard told the guests.

"I am anxious to see a plant, which I have been promised will come to Rock Springs one of these days, which will extract the oil from coal," he continued. "In addition, I am very much interested in a turbine locomotive that will use coal as its fuel instead of oil, gas or diesel oil. I hope to have within the next year a turbine engine on test using powdered coal for its fuel.

"We know that we have sufficient reserves of coal to last this country thousands of years. We hear a lot of talk about oil production. At the present time they estimate that we have enough petroleum products in reserve to last 20 to 23 years. If this is the case, why don't we use more coal? We have it. We have the people who know how to mine it, take care of it and handle it. So I am all out for taking everything out of coal except the ash and using it on a national basis for all kinds of fuel and power.

"I had an opportunity while I was in Europe to see some tests made with coal dust in jet engines," Mr. Stoddard reported. "There is just a little fly-ash in the coal that is a little difficult to overcome at the present time, but the scientists are making great strides in that direction, and one of these days we no doubt shall see planes flying with coal dust in their jet engines."

In presenting the trophy, J. I. Horty, editor, *Explosives Engineer*, pointed out that Reliance had topped the records of 159 bituminous mines entered in the 1949 contest, eight of which had operated throughout the year with perfect records. The company's D. O. Clark mine also reported no lost-time accidents during the year but received second place in the competition since it worked less man-hours than Reliance.

Leon Wisniewski, machine runner at No. 7, accepted the trophy for the miners. Other guests at the dinner included Sen. O'Mahoney and Sen. Hunt; officials of the Union Pacific R. R.; Tracy McCraken, Wyoming newspaper publisher; E. H. Denny, Denver, representing the USBM; and Edwin E. James, mayor of Rock Springs.

Featured in This Section

MEETINGS

- Kentucky Mining Institute: annual meeting, Nov. 10-11, Lexington, Ky.
- Illinois Mining Institute: 58th annual meeting, Nov. 17, Hotel Abraham Lincoln, Springfield, Ill.
- W. Va. Coal Mining Institute and Central Appalachian Section, AIME: joint meeting, Nov. 24-25, The Greenbrier Hotel, White Sulphur Springs, W. Va.
- ASME: 71st annual meeting, Nov. 26-Dec. 1, Hotel Statler, New York City.
- 19th National Power Show, under ASME auspices: Nov. 27-Dec. 2, Grand Central Palace, New York City.
- American Mining Congress: annual meeting (dinner, 6 pm), Dec. 5, University Club, New York City.

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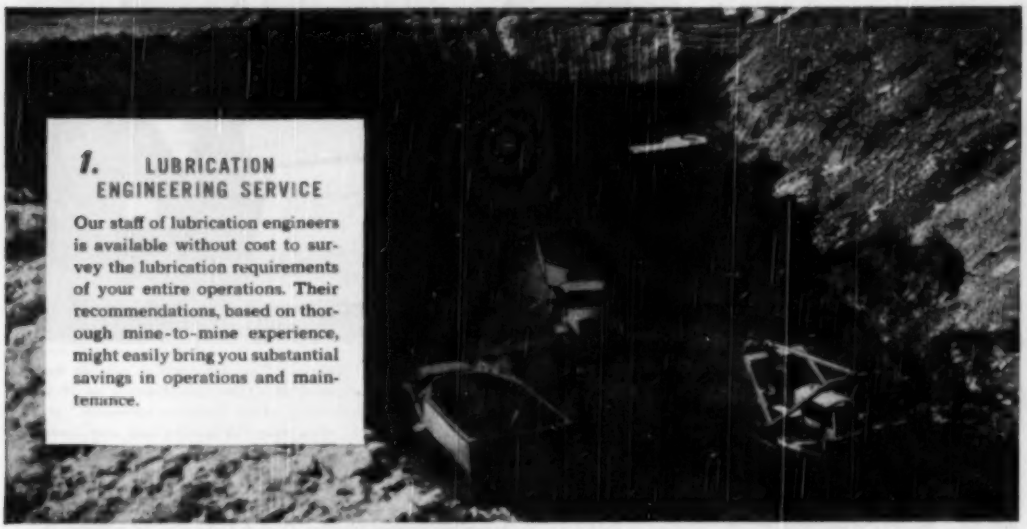

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Crichton Honored by Johnstown Leaders

MORE THAN 250 BUSINESS AND CIVIC LEADERS of Johnstown, Pa., state and national officials, joined Sept. 27 in an unusual tribute to Andrew B. Crichton, president of the Johnstown Coal & Coke Co. The testimonial dinner, which was arranged to mark Mr. Crichton's 50 yr of service to the coal industry and the Johnstown community, was held at the Sunnehanna Country Club under the auspices of the Greater Johnstown Committee for the Sesquicentennial Observance.

The program for the dinner, prepared by the committee, set the tone for the evening, commenting on Mr. Crichton's career in part as follows:

"For 50 yr he has been an integral factor in the development of the local soft coal area . . .

"But in his forward progress in the coal industry, he has never lost touch with the common man, and his efforts in behalf of the community life of this area have continued unabated.

"In fact, he is striving more energetically than ever for the good things of life for his friends and neighbors.

"Furthermore he has brought great honor to Johnstown through his numerous affiliations and contacts throughout the State, Nation, and the World.

"The citizens of Johnstown pay tribute to 'Andy' Crichton."

Among the many speakers who paid tribute to Mr. Crichton during the course of the evening were: Dr. Leonard J. Fox, executive director, Pennsylvania State Chamber of Commerce; Richard Maize, Pennsylvania Secretary of Mines; J. R. Hoffert, chief engineer, Pennsylvania Department of Health; Dr. George H. Ashley, former Pennsylvania state geologist and consulting engineer; Dr. A. W. Gauger, School of Mineral Industries, Pennsylvania State College; J. A. Appleton, vice president, The Pennsylvania R. R.; Charles E. Lawall, vice president, Chesapeake & Ohio Ry. Co.; Dr. Arno C. Fieldner, assistant director, U. S. Bureau of Mines; R. T. Laing, secretary and executive director, Central Pennsylvania Coal Producers' Association; Charles J. Potter, president, Rochester & Pittsburgh Coal Co.; and Kyle Crichton, author and magazine writer.

Climax of the dinner was presentation of a certificate prepared by the committee by Ralph E. Hough, general manager of the Bethlehem Steel Johnstown plant. The certificate's citation read: "To Andrew B. Crichton in appreciation of his contribution to the advancement of the Johnstown Community. In recognition of his standing in the nation as a coal operator, mining engineer and authority on natural resources." A large package of congratulatory messages, sent by a number of coal-industry and business leaders throughout the country who were unable to be there in person, also was presented to Mr. Crichton.

Johnstown Democrat

ANDREW B. CRICHTON (right), president, Johnstown Coal & Coke Co., receives from Ralph E. Hough, general manager of the Bethlehem Steel Johnstown plant, a certificate "In appreciation of his contribution to the advancement of the Johnstown community," at a testimonial dinner held in his honor Sept. 27. More than 250 business and civic leaders of Johnstown and national leaders participated in the tribute to Mr. Crichton.

Now 68, Mr. Crichton left school at an early age to enter mining. Starting as a mule driver, he became a mining engineer and in 1900 opened his own consulting office. In 1914 he established what is now the Johnstown Coal & Coke Co. In addition, he has had many other business interests and has long been active in coal industry affairs and organizations. He also is prominent throughout the industry for his studies and writings on coal reserves.

Consolidation Coal Co. (Ky.) Wins National Safety Meet

FIRST and second place honors in the National Coal Mine First Aid Contest at Pittsburgh, Pa., Oct. 21, were won by teams representing Consolidation Coal Co. (Ky.). Captain Blaine H. Sexton's team, representing Mine 204, Jenkins, Ky., was first with a score of 98.95%; and Captain Warrnie Flint's team, from Mine 214, McRoberts, Ky., was second with 98.75%.

The contest included 16 teams that had won state honors in the 1950 season. Kentucky, Ohio, Pennsylvania and West Virginia were represented by four teams each.

The team from Willow Grove mine, Hanna Coal Co., St. Clairsville, Ohio, led by Captain Melvin McCloud, took third place. Fourth in the competition was Captain George Moss' team from Maple Hill colliery, Philadelphia & Reading Coal & Iron Co., Pottsville, Pa.

In addition to the four winners, teams representing the following companies participated:

Carbon Fuel Co., Carbon, W. Va., Lee Stanley, captain; Puritan Coal Corp., Puritan Mines, W. Va., Walter Brumfield, captain; Jamison Coal & Coke Co., Farmington, W. Va., Michael McCullough, captain; Eastern Gas & Fuel Associates, Eccles No. 5 mine, Eccles, W. Va., E. L. Carter, captain.

Hazleton colliery, Lehigh Valley Coal Co., Hazleton, Pa., Jacob Befina, captain; Colver mine, Ebensburg Coal Co., Colver, Pa., Glenn Plummer, captain; Springdale No. 1 mine, Allegheny Pittsburgh Coal Co., Springdale, Pa., D. E. Campbell, captain.

Clover Splint mines, Consolidation Coal Co. (Ky.), Closplint, Ky., Jease Wilson, captain; Pond Creek mine, Pond Creek Pocahontas Co., Salyersville, Ky., John Zsoldes, captain.

Powhatan No. 1 mine, Powhatan Mining Co., Powhatan Point, Ohio, Alfred Horvath, captain; No. 3 mine, Rail & River Coal Co., Bellaire, Ohio, Joe Magyar, captain; Dun Glen mine, Hanna Coal Co., Dun Glen, Ohio, Anthony Eppoliti, captain.

Chief judges were A. D. Sisk, chief, Kentucky Department of Mines & Minerals; Stephen Williams, chief, Ohio Division of Mines; Richard Maize, secretary, Pennsylvania Department of Mines; Arch J. Alexander, chief, W. Va. Department of

Mines, and J. J. Forbes, chief, Health and Safety Branch, USBM. Earl R. Maize, director of safety, NCA, was contest director.

The meet was sponsored by the chiefs of departments of Mines in Ohio, West Virginia, Pennsylvania and Kentucky, and by the safety division of the National Coal Association.

Road to Labor Peace Not National Bargaining, Says Southern Coal Head

Pointing to the accomplishments and aims of his organization and expressing the opinion that national bargaining is not in the interest of the bituminous industry, Joseph E. Moody, president, Southern Coal Producers' Association, offers the following comments on "New Start on Labor Peace," a feature of the September issue of *Coal Age:*.

"I think you are wrong in assuming that the best method of negotiation is on a national basis. Your comment seems to take that position; that is, that the only favorable way of negotiating a contract would be on an industry-wide basis, and we certainly cannot agree with you on that. There are too many wide differences in interest in the coal industry for that to be successful.

"You refer to the Southern Coal Producers' Association as the 'second organization.' Perhaps this is an inadvertence, but in my opinion it is unfortunate. The Southern Coal Producers' Association has been in existence 10 years, and certainly any review of past negotiations will justify the statement that the southern group has time and time again furnished leadership in the industry for the fight that has been made.

"Many of the recommendations that you make in your article have been part of the Southern's policy, so your comments should be not about something that should be done in the future but rather that they are things that have been done. I refer specifically to your recommendation of proposals being made for negotiation. As you know, we did offer specific proposals in June and again in October.

"Our position is very definite that because of the great difference in the competitive position in the broad sections of the industry, such as the Pennsylvania and Ohio group, which will now be represented by the 'new organization,' and the Indiana and Illinois groups, which are not so organized, and our own Southern Coal Producers' Association should constitute natural groupings that should be maintained in a strong, virile condition if we are ever to get a sound, stable condition in this industry and one based on a fair contract, where both parties must carry their due share of the responsibility for the administration of the contract."

Lehigh Valley Team Tops Anthracite Safety Meet

THE OUTSIDE TEAM of the Hazelton Shaft colliery, Lehigh Valley Coal Co., became the 1950 first-aid champions of the anthracite region when it took top honors among the 23 teams participating in the 6th annual Safety Day and First Aid Contest held Sept. 30 in Dallas, Pa.

Team members were: Byron B. Evert (left, first row), Joseph A. Leotilo, Michael J. Hudock, Jacob DeFina, captain, Vincent J. Fanelli, John H. Churback and Rocco J. Capece.

Standing directly behind the team are William Isaac, assistant colliery superintendent; William Barager, foreman; Osborne Morgan, company safety engineer; Barton D. Gundry, colliery superintendent; and G. H. Drum, production engineer. At the left rear are Richard Maize, Pennsylvania Secretary of Mines; and Edwin Curtis, state mine inspector.

Winning team members received cash awards of $25 apiece and individual trophies, and possession of the championship cup. The awards were presented by H. A. Dierks, vice president and general manager, Glen Alden Coal Co.

The team from the Maple Hill colliery of the Philadelphia & Reading Coal & Iron Co. placed second in the contest. Third place was taken by the Nesquehoning Colliery No. 2 inside team, Lehigh Navigation Coal Co., Inc.

What's Happening to Coal and Business Activity

Coal Production		1950 to This Date	1950 Over 1949 to Date
Est. anthracite prod., week ending Oct. 7	1,003,000	34,343,000	+9.3%
Est. bituminous prod., week ending Oct. 7	11,415,000	376,942,000	+6.7%

Source: U. S. Bureau of Mines.

	Bituminous Coal Stocks (Thousands, net tons)				Consumption (Thousands, net tons)		
	Sept. 1, 1950	Days' Supply	Aug. 1, 1950	Sept. 1, 1949	Aug., 1950	July, 1950	Aug. 1949
Electric power utilities	22,929	91	20,581	25,458	7,782	6,797	6,732
By-product coke ovens	12,353	47	10,395	13,604	8,183	8,340	7,384
Beehive coke ovens	----	--	----	----	1,006	795	77
Steel and rolling mills	928	49	891	1,152	583	539	551
Cement mills	1,089	50	944	1,454	670	625	641
Other industrials	15,579	63	13,702	15,912	7,624	6,735	7,486
Railroads (Class I)	3,746	23	3,238	8,196	4,988	4,750	5,133
Retail dealers	2,344	10	2,226	2,845	7,118*	5,238*	5,586*
Total	58,964	48	51,979	68,621	37,954	33,819	33,589

Source: U. S. Bureau of Mines. *Retail dealer deliveries.

Business Activity	Latest Week*	Month Ago	Year Ago
Business Week Index of Business Activity, wk. ending Oct. 14	*223.3	221.3	161.1
Steel ingot operations (% of capacity)	102.0	100.4	9.3
Electric power output (million kw-hr)	6,509	6,449	5,481
Crude oil production (daily avg., 1,000 bbl.)	5,862	5,938	5,044
Misc. and L.C.L. carloadings (daily avg., 1,000 cars)	82	81	67
All other carloadings (daily avg., 1,000 cars)	62	61	29
Prices, spot commodity index (Moody's, Dec. 31, 1931 = 100)	464.1	475.4	336.1
Prices, industrial raw materials (B.L.S., Aug., 1939 = 100)	317.0	311.7	224.1
Prices, domestic farm products (B.L.S., Aug., 1939 = 100)	344.8	355.4	292.5
Prices, finished steel composite (*Iron Age*, lb.)	3.837c	3.837c	3.705c
90 stocks, price index (Standard & Poor's Corp.)	157.5	153.0	126.1

*Date of latest week for each series on request.

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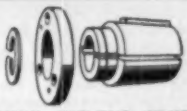

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Pennsylvania Safety Champs Receive Trophy

MEMBERS OF THE WINNING TEAM in the 8th annual statewide Pennsylvania Bituminous Championship First Aid Contest Sept. 9 receive the permanent MSA Trophy from George H. Deike, president, Mine Safety Appliances Co., Pittsburgh. Shown receiving the trophy is Glenn Plummer, captain of the team from Ebensburg No. 1 mine of the Ebensburg Coal Co., Colver, Pa., which ranked first among the 40 top teams which had qualified in district contests held in the state. At the left of Mr. Deike is Richard Maize, Pennsylvania Secretary of Mines.

Industry Group Forms Coal Defense Committee

Formation of a Coal Defense Committee composed of representative mining men from all sections of the industry, including manufacturers of mining equipment, was announced Oct. 3 by James D. Francis, chairman of the board, Island Creek Coal Co., Huntington, W. Va., and Geo. H. Love, president, Pittsburgh Consolidation Coal Co., Pittsburgh, Pa.

Messrs. Francis and Love acted as co-chairmen in setting up the new organization, which is headed by Wm. H. Cooke, president, Little Sister Coal Corp., Chicago. Mr. Cooke will be assisted by G. Don Sullivan, assistant to the president, Ayrshire Collieries Corp., Indianapolis. As chairman of the committee, Mr. Cooke is expected to spend the major portion of his time in Washington.

The objective of the committee is to cooperate with all agencies of government during the present emergency to insure that an adequate supply of coal is made available to meet the needs of the nation.

Some of the problems requiring immediate attention are those of providing adequate rail transportation, providing machinery and supplies for continued operation of the mines, and the furnishing of manpower for the armed forces without impairing production of needed fuel.

Membership of the committee is as follows:

Wm. H. Cooke (chairman), president, Little Sister Coal Corp.; G. Don Sullivan (assistant to chairman), assistant to president, Ayrshire Collieries Corp.; I. N. Bayless, president, Union Pacific Coal Co.; L. C. Campbell, vice president, Coal Division, Eastern Gas & Fuel Associates; Julian Conover, secretary, American Mining Congress; E. H. Davis, president, New York Coal Co.; J. D. Francis, chairman of the board, Island Creek Coal Co.; J. H. Fulford, vice president, Jeffrey Mfg. Co.; L. E. Gaines, president, New River Co.; Wm. Goodman, president, Goodman Mfg. Co.

Chas. R. Griffith, president, Southern Coal & Coke Co.; H. R. Hawthorne, president, Pocahontas Fuel Co., Inc.; L. Russell Kelce, president, Sinclair Coal Co.; R. H. Knode, president, Stonega Coke & Coal Co.; Geo. H. Love, president, Pittsburgh Consolidation Coal Co.; Hooper Love, president, West Kentucky Coal Co.; Fred S. McConnell, president, Enos Coal Mining Co.; F. M. Medaris, vice president, Harvey Coal Corp.; J. D. A. Morrow, president, Joy Mfg. Co.; F. S. Mulock, president, U. S. Smelting, Refining & Mining Co.

C. J. Potter, president, Rochester & Pittsburgh Coal Co.; E. R. Price, manager coal properties, Inland Steel Co.; Geo. H. Rupp, manager, mining Dept., Colorado Fuel & Iron Corp.; Dr. Huston St. Clair, president, Jewell Ridge Coal Corp.; R. E. Salvati, president, Island Creek Coal Co.; O. L. Scales, vice president, Enos Coal Mining Co.; Henry G. Schmidt, president, The Powhatan Mining Co.; R. E. Snoberger, president, Binkley Coal Co.; Laurence E. Tierney Jr., president, Eastern Coal Corp.; Howard I. Young, president, American Zinc, Lead & Smelting Co.; and J. D. Battle (secretary), executive vice president, National Coal Association.

Among the Manufacturers

Chester F. Conner, manager of industrial products sales, B. F. Goodrich Co., Akron, and a widely known figure in the rubber industry, has been placed on the company's retirement payroll after 40 yr of service with the company. New appointments in the organization include Paul W. Van Orden, industrial products merchandise manager; Richard G. Cox, manager of original equipment sales; Wilfred A. Smith, manager of molded, extended, lathe-cut and sponge sales; and George J. Fischer, manager of V-belts and packing sales.

Heyl & Patterson, Inc., Pittsburgh, Pa., has appointed H. G. Dillon vice president in charge of sales and B. A. Rose vice president in charge of engineering. For the past 4 yr Mr. Dillon has been sales manager and Mr. Rose has been director of engineering. E. W. Kahle, formerly assistant treasurer, has been named treasurer. E. E. (Bud) Bauer has been appointed contract engineer for the company and will serve the steel and utility market in the western territory.

Joy Mfg. Co. has organized the Joy Finance Corp. as a wholly owned subsidiary "to better meet the credit needs of its customers in the purchase of new equipment." Established with an authorized capital of $2,000,000, the new firm will purchase all installment notes secured by title-retaining contracts which Joy may acquire in the sale of its equipment.

Henry M. Sossaman has been named general sales manager, Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia. Mr. Sossaman, who joined the company 22 yr ago as a salesman, was promoted to assistant general sales manager in 1943. Other promotions within the organization include that of Charles E. Dugan as assistant general sales manager; Jack R. Lewis, assistant sales manager; Thomas L. Durkin, manager of contract sales; Art M. Lowrey, Philadelphia district sales manager; and Benjamin Shawcross, manager of molded hose department.

R. G. Bellezza, formerly in charge

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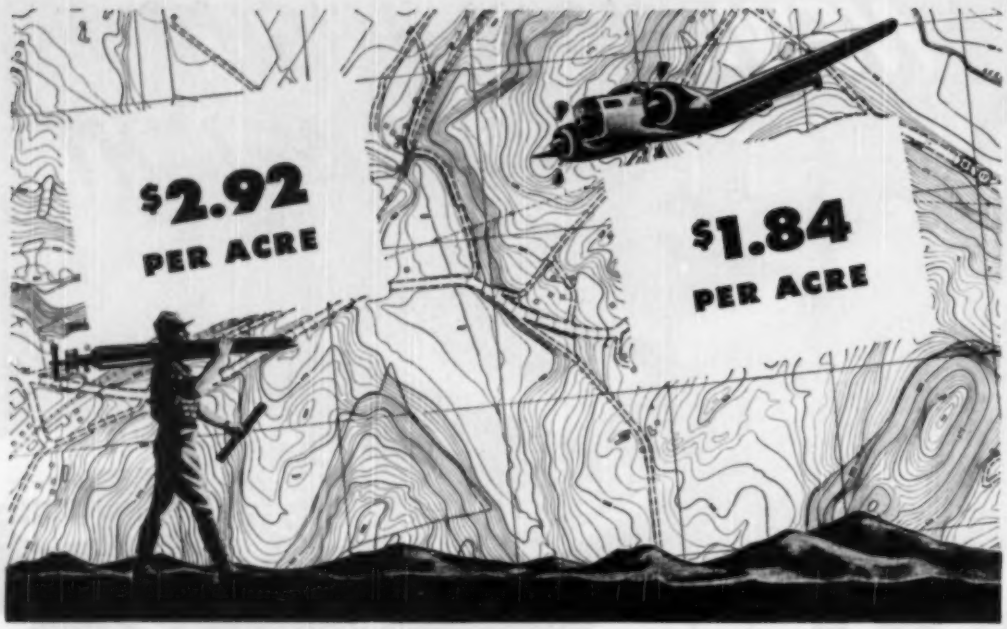

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EQUIPMENT APPROVALS

Six approvals of permissible equipment were issued by the U. S. Bureau of Mines in September, as follows:

Goodman Mfg. Co.—Types G or GS-20 shaker conveyors; one motor, 20 hp, 200 v, ac; Approval 2-705; Sept. 11.

Joy Mfg. Co.—Type PL11-17RPG/N elevating chain conveyor; one motor, 15 hp, 220 and 500 v, ac; Approvals 2-756 and 2-756A; Sept. 13.

Joy Mfg. Co.—Type 14BU-7A and BG/H/HH/N loading machine; five motors, one 4 hp, and four 7½ hp, 220 and 440, 415 and 500 v, ac; Approvals 2-757 and 2-757A; Sept. 19.

Joy Mfg. Co.—Type 18HR-1E hard-rock loader; four motors, one 50 hp, two 7½ hp and one 4 hp, 250 v, dc; Approval 2-758; Sept. 20.

Joy Mfg. Co.—Type PL11-17RPV elevating chain conveyor; one motor, 15 hp, 400 v, ac; Approval 2-759A; Sept. 25.

Albert & J. M. Anderson Mfg. Co. —Distribution box; single outlet, 250 v, dc; Approval 2-760; Sept. 28.

of cable sales for General Electric Co., Schenectady, and more recently chief executive officer for Locke, Inc., a GE subsidiary, has been named vice president in charge of sales for the General Cable Corp., New York.

D-A Lubricant Co., Inc., Indianapolis, has appointed Jack P. Rosenham a representative in its West Virginia territory. He will be associated with his father, C. J. Rosenham, Huntington, who has represented D-A in West Virginia for the past 8 yr.

George C. Johnson has resigned as general sales manager, Quaker Rubber Corp., Philadelphia, to join the Hamilton Rubber Mfg. Corp., Trenton, N. J., as promotional sales manager.

P. L. Edwards has been appointed manager of the Central district office, Pittsburgh, by Raybestos-Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J., succeeding R. C. Rice, who has retired from active service with the company. During recent years, Mr. Edwards has served as assistant to Mr. Rice.

Robert D. Allison, formerly purchasing agent, Whiteman Div., National Mine Service Co., has been appointed general purchasing agent for all divisions of the company, with headquarters at Indiana, Pa. In coordinating buying on an over-all basis, Mr. Allison will be assisted by John Delaney, purchasing agent, Whiteman Div., Indiana, Pa., and F. V. Holsopple, purchasing agent, Bemeco Div., Beckley, W. Va.

Five appointments in the Schenec-

tady Large Motor and Generator Engineering Div. of the General Electric Apparatus Department have been announced by Earle S. Henningsen, manager of engineering of that division. Bascom H. Caldwell Jr. has been named assistant manager of engineering and D. E. Brainard, Howard D. Snively, Robert V. Shepherd and Robert W. Wieseman, division engineers.

John Lundahl has been appointed to the newly created position of sales representative-at-large by the Detroit Diesel Engine Div., General Motors Corp. Mr. Lundahl comes to Detroit from St. Louis, where he served the Western Machinery & Engine Co., GM Diesel Distributors, as vice president in charge of sales and service. R. D. Redner has been promoted to sales representative and will work through the division's distributor organization in Minnesota, North and South Dakota, Iowa, Nebraska, western Missouri and Kansas.

Appointment of Henry A. Rome as manager of special products sales, William C. Hall as manager of molded goods sales and Thomas S. Savoury as manager of flooring sales for the mechanical goods division, U. S. Rubber Co., has been announced by W. A. Tipton, manager of branch sales.

Marion Power Shovel Co. has appointed Charles K. Essex a sales representative covering a large part of northeastern Ohio, three northern Pennsylvania counties and a section of northwestern New York, with headquarters in the company's general offices in Marion, Ohio.

A controlling stock interest in the Commonwealth Electric Co., Ltd., Welland, Ont., has been purchased by The Reliance Electric & Engineering Co., Cleveland. The manufacture of transformers and electric motors, both Commonwealth products, will be continued in the Welland plant and its operations will be expanded just as rapidly as possible to permit the production of Reliance V-S drives and other specialized electric drives for both Canada and the U. S., the company reports. J. W. Corey, Reliance president, will serve as president of the new subsidiary.

The largest single expansion in its 30-yr history has been announced by Cummins Engine Co., Inc., Columbus, Ind. Immediate construction of a new building will make available 2.1 acres under one roof and add 92,000 sq ft of floor space to its factory facilities. In announcing the expansion, Irwin Miller, president, said that when the new building is finished, Cummins will have spent more than $5,000,000 since the end of World War II for additional manufacturing facilities and for modernizing the Columbus plant. Production capacity has been increased by 60% in the last 5 yrs. Appointment of two new assistant regional managers also has been announced. Edward Dalay, formerly San Francisco

WHY MINE OPERATORS GET

30% to 60% Longer Service

J&L STEEL

Mine operators get 30% to 60% and even *longer* service from wire ropes of this unique design because *it has more steel and fewer voids than any conventional wire rope!* Result: Higher strength . . . Greater flexibility . . . Easier handling . . . Longer life.

Published records prove that this wire rope, when used in applications for which it was designed, reduces operating costs, diminishes downtime and increases profits.

Known as CENTERFIT, an exclusive J&L wire rope, it is laid together in *one* operation. All strands run in the *same* direction. Outside strands fit snugly into valleys between inside strands, eliminating crossing as in conventional designs. *This prevents internal nicking.*

CENTERFIT is recommended for *hoist lines, closing lines, cable controls* on earth moving equipment, and *draglines* when operating on small diameter drums and sheaves.

In addition *only* J&L wire rope is lubricated with BRONZ-LUBE — the lubricant with the high film strength that prevents squeezing out between strands. BRONZ-LUBE contains fine flakes of soft bearing metal providing a smooth wear-resistant bearing surface for every wire—forms close adherent coating that doesn't drip off unless subjected to high temperature.

HERE'S HOW YOU CAN SAVE MONEY ON WIRE ROPE

Keep an accurate performance record on your present wire rope on applications mentioned above. When it is worn out, switch to J&L CenterFit and compare its performance with what you are now using. We'll gladly send you a wire rope service card with a plastic holder *free!* Write on your business letterhead to: Jones & Laughlin Steel Corporation, 411 Jones & Laughlin Building, Pittsburgh 30, Pennsylvania.

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

district manager for the Marion Power Shovel Co., has joined Cummins, with headquarters in Los Angeles. Burton C. Sears, formerly sales engineer, has been made assistant manager for the Southeastern region, with offices in Atlanta.

Atlas Chain Co. Mfg. Co., Philadelphia, has opened a new branch office and warehouse at 570 Randolph St., Chicago. To offer Midwest customers faster service, the new branch will stock all types and sizes of roller chain and attachments and will have available a staff of experienced transmission specialists to aid in the proper selection and application of Atlas products.

Johnston Pump Co., Los Angeles, has elected Kenneth G. Lundie vice president in charge of sales and Perry Brown vice president in charge of engineering. Mr. Brown formerly was chief engineer and Mr. Lundie was sales manager.

Fred P. Biggs, formerly first vice president, has been appointed president of the Brake Shoe & Casting Div., and Stephen S. Conway has been appointed vice president in charge of sales of the Brake Shoe & Castings and Southern Wheel Div., American Brake Shoe Co. Ralph L. Robinson, assistant vice president, has been named vice president of the two divisions, and Edward R. Anderson has been made vice president of the Brake Shoe & Castings Div.

Adoption of a program which will add 500,000 tons of annual ingot capacity and thus increase the steelmaking capacity of Tennessee Coal, Iron & R.R. from 2,850,000 tons to 3,350,000 tons per year within 18 to 24 mo was announced last month. "To obtain this additional 500,000 tons of steel capacity, the output of the existing blast furnaces in the Birmingham District will be stepped up through the blending of imported iron ore with the lower-grade Alabama ores. To convert such increased production of iron into steel, new modern open-hearth furnaces and certain auxiliary facilities will be installed at the Fairfield Works," the company reported.

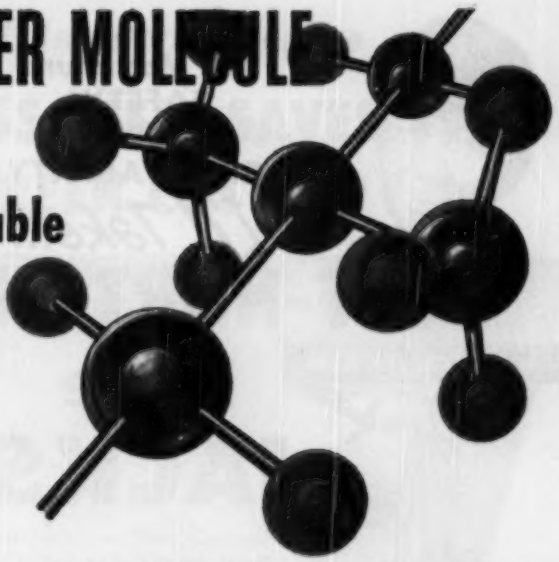
Red Jacket Mfg. Co., Davenport, Iowa, has announced that John Vonderheide has joined its organization as part of a new sales program. For the past 5 yr before joining Red Jacket, Mr. Vonderheide was general sales manager, A. D. Cook, Inc.

Personal Notes

Thomas G. Fear has joined the engineering department of the Clinchfield Coal Corp., Dante, Va.

Millard Craynor has been promoted from section foreman to general assistant foreman, Weeksbury mine,

This MADE-TO-ORDER MOLECULE means longer service for G-E mine power cable



COMPARE—and be convinced!

These figures, comparing Super Coronol insulation with ASTM and IPCEA requirements, show conclusively the superior physical and electrical properties of this cable.

PHYSICAL PROPERTIES

	IPCEA AND ASTM REQUIREMENTS	SUPER CORONOL (Typical Values)
Original		
Tensile strength, lb/sq in.	450	750
Per cent elongation	250	600
Set in 2-in. test piece in.	½	⅛
After 7 days in geer oven at 70 C		
Tensile strength, lb/sq in.	400	700
Per cent elongation	200	525
After 48 hours in oxygen bomb at 70 C		
Tensile strength, lb/sq in.	400	675
Per cent elongation	200	525
Cold bend	—10 C	—10 C†
Ozone resistance	3 hours	excellent††

ELECTRICAL CHARACTERISTICS

Insulation resistance		
K value	5280	15000 and up
Power factor, per cent	5	1

†Can be installed at temperatures down to —40C

††Many samples have shown no signs of depreciation after 72 hours' exposure.

Billions upon billions of these man-made Butyl molecules form the basic ingredient of the insulation of General Electric Super Coronol mine power cable—molecules custom-built to assure extra-long cable life even under the most difficult operating conditions. This insulation—actually an improvement on nature—permits Super Coronol cable to offer all these advantages:

OZONE-RESISTANT. Super Coronol cable is ideal for high-voltage installation—to 15,000 volts—wherever there is danger of corona and resulting ozone.

MOISTURE-RESISTANT. Use Super Coronol in conduits, ducts, or directly buried.

HEAT-RESISTANT. Super Coronol provides efficient operation to 80 C.

HIGHLY FLEXIBLE. Even at extremely low temperatures Super Coronol flexes easily.

EXTREMELY STABLE. Super Coronol is highly resistant to oxidation and aging, and to acids, alkalies, and sunlight as well.

LIGHTWEIGHT. In medium-depth borehole installations, Super Coronol cable may be directly suspended by the conductors.

ELECTRICALLY PROTECTED. The conductors in Super Coronol mine power cable are covered with a metallic shield to drain off induced potential charges; ground wires provide a low-resistance ground-return circuit.

MECHANICALLY PROTECTED. Jacketed with tough, smooth Geoprene, Super Coronol cables take abrasion in stride, may be re-used in other locations as requirements change.

Cable replacement costs go down in a hurry when you specify General Electric Super Coronol cables. You can't afford to ignore these savings. For further information, consult your local G-E Construction Materials Distributor or cable specialist. Section W22-1114, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

You can put your confidence in—

GENERAL ELECTRIC

Westfield Named to Bureau Safety Post

The appointment of James Westfield as chief of the Accident Prevention and Health Div., Region VIII, U. S. Bureau of Mines, has been announced by H. P. Greenwald, regional director. In his new assignment, Mr. Westfield will head some 330 Bureau employees engaged in promoting health and accident prevention in coal and other mining operations in the 17 states of the Bureau's Northeastern region.

Mr. Westfield received his mining-engineering degree from the University of Utah and since joining the Bureau at Salt Lake City in 1928 has held various assignments throughout the country. From 1944 to 1948, he was in charge of the Anthracite-Flood-Prevention Section at Wilkes-Barre.

W. Dan Walker Jr., a former federal mine inspector in West Virginia now in Pittsburgh, will serve as assistant to Mr. Westfield and also will head the Pittsburgh branch of the division.

Eastern Gas & Fuel Associates. At the Stotesbury operation, **Harry Kirkman,** formerly night foreman, has been made mine foreman, and **Fred Ritch,** former mine foreman, his general assistant on the day shift. **Evam Maynard,** who recently transferred from Helen mine, has been appointed night foreman.

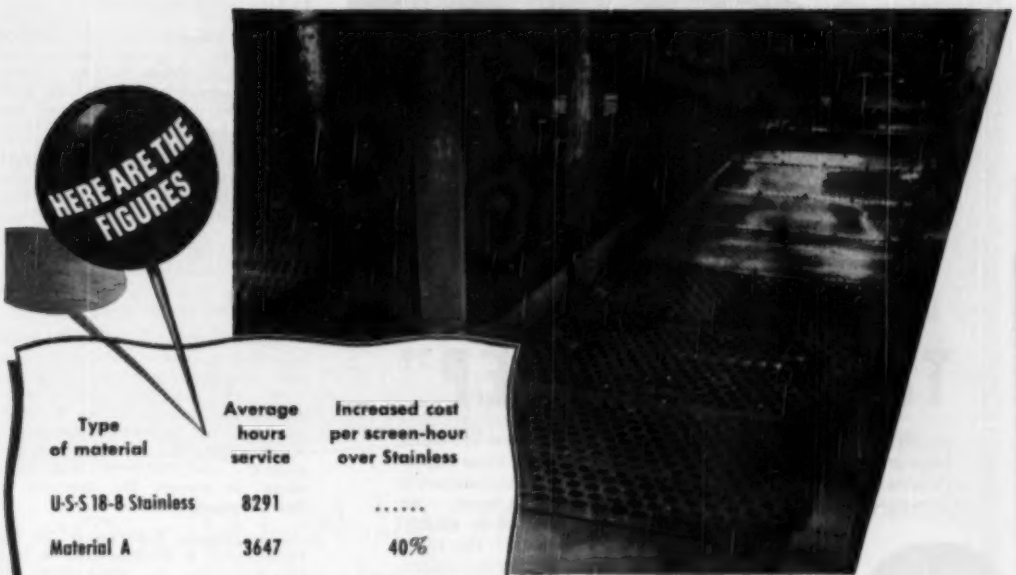
George Gdovichin has resigned as section foreman Sonman mine, E.G. & F.A., to join a Pennsylvania Coal & Coke Corp., operation as assistant to the mine foreman.

Lynn Trovillion, assistant superintendent of the Taylorville Div., Peabody Coal Co. since Jan. 1, 1949, has been named superintendent of the division. **Joe Craggs,** formerly at No. 8 mine, has been appointed assistant superintendent to succeed Mr. Trovillion.

Irvin Davis, president, Hatfield-

In severe desanding and dewatering service

U·S·S STAINLESS STEEL SAVES 40% ON SCREEN COSTS



Type of material	Average hours service	Increased cost per screen-hour over Stainless
U·S·S 18-8 Stainless	8291	.....
Material A	3647	40%
Material B	700	1000%

IN a series of service tests on the bottom decks of refuse shakers at the Hudson Coal Company, Scranton, Pa., U·S·S Stainless Steel proved conclusively that it costs less than other screen materials because it stands up longer.

Tests involved 14 and 16 gage 36″ x 72″ screens with 3/32″ round holes. The *best* record for a material other than Stainless was 3647 hours. But Stainless Steel was in service 8291 hours, more than twice as long. This meant a saving in hourly screen cost of 40%. What's more, the U·S·S 18-8 screens were still serviceable at the end of the test.

These figures show clearly how the longer service that U·S·S Stainless Steel gives far offsets its somewhat higher first cost.

Hudson tested these materials under the most severe service conditions—removing acidulous water and sand mixed with the refuse.

Stainless Steel's ability to resist abrasion prevents rapid reduction in screen thickness and maintains the size of the holes longer than other materials. Its superior corrosion resistance also helps keep holes clean and sharp and thus assists in preventing blinding.

Your fabricator can furnish the types of U·S·S Stainless Steel screens best suited to your operations. Contact him today to take advantage of this extra tonnage and lower cost per hour of operation.

AMERICAN STEEL & WIRE COMPANY, CLEVELAND · CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH
COLUMBIA STEEL COMPANY, SAN FRANCISCO · NATIONAL TUBE COMPANY, PITTSBURGH · TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

UNITED STATES STEEL

Campbell Coal Co., Cincinnati, has submitted his resignation to the new owners of the company, severing a 40-yr association with the Hatfield organization.

Ishmael J. Ratliff has been appointed safety and coal-inspection engineer for the Bird Coal Co., Tire Hill, Pa. Mr. Ratliff is a former federal coal-mine inspector and is president of the Windler Council of the Joseph A. Holmes Safety Association.

C. H. Burgess has been elected treasurer of the United Electric Coal Co., Chicago, Frank F. Kolbe, president, announced last month. Mr. Burgess formerly was director of the strategic materials div. of the ECA.

William W. F. Brinkley, assistant treasurer since Jan. 1, 1946, has been elected treasurer of the General Coal Co., Westmoreland Coal Co., Westmoreland, Inc., Stonega Coke & Coal Co. and the Virginia Coal & Iron Co. **Russell Thayer**, who has been treasurer of the companies for many years, continues as vice president.

Robert K. Beacham, general superintendent, has been promoted to general manager, Ayrshire Collieries Corp., and subsidiary mining companies, Indianapolis, James W. Morgan, president, announced last month. **N. A. Endicott**, formerly assistant general superintendent, has been named to succeed Mr. Beacham as general superintendent.

Louis Eberle, land agent for the Philadelphia & Reading Coal & Iron Co., Pottsville, Pa., since 1918, has retired after 55½ yr of service with the company. Mr. Eberle joined P. & R. in 1895 as a member of the engineering corps and progressed through various positions until he was named land agent in July, 1918. **Fred C. Hatter** has succeeded Mr. Eberle, with the title of property engineer. Mr. Hatter joined the company's engineering corps in 1917 and since 1936 has been property engineer in the Pottsville office.

Martin Kuretich has retired after 54 yr of service at the Crested Butte mine of the Colorado Fuel & Iron Corp., 31 yr of which as mine foreman.

Obituaries

Rodney T. Artz, 43, USBM mining engineer specializing in mine-ventilation problems, died of a heart attack Sept. 29 in a Philadelphia railroad station as he was returning to his home after a conference with mine operators in that city. Mr. Artz joined the Bureau in 1943 and since 1944 he had been associated with the Health and Safety Div. in Pittsburgh. Following graduation from Penn State College in 1929, Mr. Artz was

PROOF OF DEPENDABILITY

"Our TD-24 has operated continuously for ONE YEAR with only ordinary maintenance"

The C. & S. Coal & Clay Co. of Zelienople, Pa., makes that statement about its International TD-24. The company operates a large coal strip mine and the going is rugged on tractors in the rough Pennsylvania hills. But the TD-24 is doing a splendid job of removing overburden and it has the stamina to stay on the job day after day, with only ordinary maintenance.

Here's one more proof of the rugged dependability of the International TD-24. It's tougher than any job it is given to do. And this mighty crawler is designed to do the toughest earthmoving jobs. No wonder it is known everywhere by owners and operators as the "Champion of Crawlers."

It's time for you to join the army of enthusiastic TD-24 owners and operators. Yes, it's time to see your International Industrial Power Distributor about getting the "Champion of Crawlers" to work for you. No matter how tough your strip mining operations may be, you can depend on the TD-24 to handle the task. And you can depend on the TD-24 to deliver profit-making production with a bare minimum of maintenance. It pays to count on the "Champion of Crawlers."

INTERNATIONAL HARVESTER COMPANY • Chicago 1, Illinois

CRAWLER TRACTORS
WHEEL TRACTORS
DIESEL ENGINES
POWER UNITS

INTERNATIONAL HARVESTER

INTERNATIONAL
INDUSTRIAL POWER

employed by Consolidation Coal Co. (W. Va.) for a year. From 1930 to 1940 he was associated with the Philadelphia & Reading Coal & Iron Co. and for the 3 yr before joining the Bureau operated his own contract and strip-mine company. Many of his investigations of coal-mine ventilation problems have been published by the Bureau.

Herbert D. Buchannan, 79, secretary-treasurer, Crowe Coal Co., died Sept. 30 at St. Luke's Hospital, Kansas City, Mo. He had been associated with the company for 50 yr.

Joseph E. Johnson Sr., 75, a widely known pioneer coal operator in the Hazard field, died Sept. 23 at his home in Lexington, Ky. At the time of his death, he was president of the Blue Grass Mining Co., Darb Fork Coal Co., Blue Bird Mining Co., Jeda Coal Co., and Blue Grass Coal Co. Mr. Johnson was one of the organizers of the Hazard Coal Operators' Association and Appalachian Coals, Inc. He was secretary-treasurer of the Hazard Association from 1921 to 1933 and also was president in 1923 and 1924.

Duffy Forbes, 42, superintendent, No. 5 mine, Carbon Fuel Co., Jochin, Kanawha County, W. Va., was killed in a slate fall Sept. 22. Mr. Forbes, who had been employed by Carbon Fuel for a number of years, had gone into a worked-out section to remove equipment when the accident occurred.

Patrick Haddock, 60, owner, Haddock Coal Co., Thornburg, Pa., died Sept. 20 following a heart attack.

Jay C. Jamison Sr., vice president, Jamison Coal & Coke Co., Greensburg, Pa., died Oct. 16, following a short illness.

Richard A. Farland, 70, for the last 3 yr vice president of the Farland Fuel Corp., Morgantown, W. Va., died Oct. 8 in a Morgantown hospital. For many years Mr. Farland was associated with banks in Clarksburg and Wheeling, W. Va., and in 1943 came to Morgantown to become associated with the Frank E. Christopher Coal Co.

Peter A. Roos, 90, a long-time employee of the Philadelphia & Reading Coal & Iron Co. and father of George A. Roos, vice president in charge of operations for the company, died recently. The senior Mr. Roos was outside superintendent of the P. & R. Mt. Carmel district when he retired in 1927.

Fred I. Conyers, 70, a retired strip-mine superintendent, died Aug. 11 at Princeton, Ind., after an illness of 3 yrs. Mr. Conyers was one of the pioneers in the Pike County, Indiana, strip field. He was active in opening the Enos stripping in 1921 and also in the opening of the Blackfoot strip mine.

Allan O. Geertz, fuel engineer for

the Pennsylvania R. R. and a nationally known combustion engineer, died Sept. 21 at the University Hospital, Philadelphia, after a long illness. Mr. Geertz joined the Pennsylvania in 1919 and was appointed fuel engineer in 1943. He was the author of several scientific articles on coal-mining practices.

Car-Supply Improvement Seen as Gradual

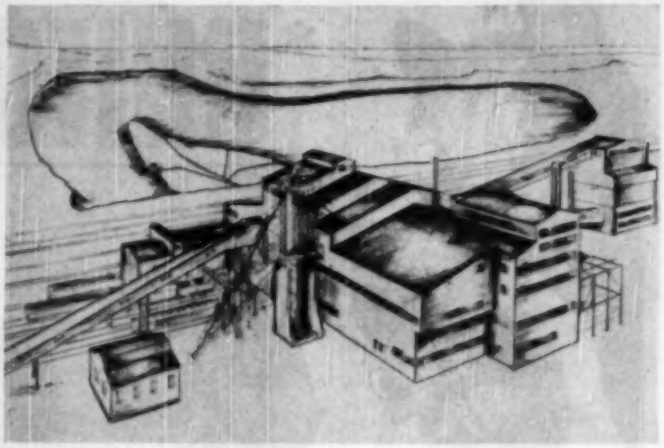
The prospects for an immediate substantial improvement of the railroad-car situation are none too bright, Appalachian Coals, Inc., reported early last month. While steps are underway that will result in gradual improvement, coal consumers in the meantime should take their coal supplies as quickly as possible and shippers, railroads and consumers should do everything possible to keep all available cars on the move, it was suggested.

"Some serious hopper-car shortages have also developed since July 1, amounting to over 8,500 cars per day during recent weeks," and shortages of gondolas have been running at the rate of about 7,000 cars per day, W. E. Callahan, manager of the AAR car service division, reported. Since the end of World War II, the railroads have purchased and installed nearly 300,000 new freight cars, or about 17% of the present fleet, he said. Individual railroads reportedly are planning to place orders for new freight cars to increase the total of 1,722,000 as of Aug. 15 to 1,850,000 just as quickly as possible. As of Sept 1, 81,000 new cars were on order, including 18,816 gondolas and 10,714 hoppers.

The minimum freight-car building program submitted to the NPA by the Defense Transport Administration will not provide enough coal cars even if there is no reduction in the program, the NCA reported Oct. 18. The DTA called for an increase in hopper cars from 566,513 to 575,000, or only about 2%, in proposing to add a net total of 75,600 freight cars by June 30, 1952. Gondolas would be upped from 288,965 to 325,000 by July 1, 1953, it said.

Meanwhile, it was elsewhere reported from Cleveland that several coal operators were planning to bring suit shortly against the New York Central R. R. charging favoritism in its distribution of coal cars. In the suit, which will also be directed against the ICC and the AAR, the Central will be charged with supplying cars to the mines of the Jefferson Coal Co., which permitted the operations to work full time over the week in question, while mines of other companies on the same division of the railroad were forced to close during the entire week because of car shortages. Triple damages are to be asked, the report indicates.

Correcting the Record . . .



Old Ben Washery to Use McNally-Tromp Process

NEW WASHERY at the Valier, Ill., mine of the Old Ben Coal Corp. (above), is being built by the McNally Pittsburg Mfg. Corp. This statement corrects an erroneous report in October *Coal Age* (p 172), which attributed design and erection of the plant to another manufacturer.

The new plant will incorporate the first McNally-Tromp dense-media system in the United States and will be one of the industry's most modern dense-media installations. The Tromp process has been one of the outstanding coal-cleaning processes in Europe for many years.

The Editors are glad to set the record straight and apologize to readers and the companies involved for publication of the incorrect item last month. Full details of the plant's facilities are reported below.

Preparation Facilities

Old Ben Coal Corp., Mine No. 22 (formerly Valier No. 1 mine), Valier, Ill.—Contract closed with McNally Pittsburg Mfg. Co. for 800-tph r-o-m handling, crushing and storage and 860-tph dense-media coal-cleaning addition, consisting of five McNally Tromp automatic dense-media baths for washing 6½x5/16-in; one of the five McNally Tromp baths to rewash middlings from 1-in crushed to 1-in minus and returned to raw-coal circuit; all 5/16x0-in raw coal plus 5/16-in-minus middlings to be washed in a McNally Rheo fine-coal launder system and vibrator dewatered at 10 mesh; 5/16-inx10-mesh may be loaded directly or join 10-meshx0-in deslimed for drying in a battery of McNally Carpenter centrifugal dryers; complete binning facilities of the 1½-in-minus washed coals; bins equipped with variable feeders for blending specification fuels.

Pittsburg & Midway Coal Mining Co., Mine No. 19, Hallowell, Kan.—Contract closed with McNally Pitts-

burg Mfg. Co. for complete 500-tph tipple and washery plant with the following facilities: all plus 6-in to be broken to 6-in minus in McNally Pittsburg rotary breaker, 6-in-plus rock discharged to rock bin; 6x0 broken r-o-m to be screened at 1¼ in; 6x1¼-in raw coal to be washed on one 6-cell McNally Norton automatic washer; crushed middlings from main washer to join the 1¼x0 rescreened raw coal and then treated in one reconstructed McNally Norton automatic washer; McNally Rheolaveur launders to be employed for rewash of ¼x48-mesh; washed coals classified at 3, 2, 1¼ and ⅝ in; ¼x0 rewashed fines to be treated in battery of McNally Carpenter centrifugal dryers and returned to loading circuit for blending; all plus 1¼-in washed coals subject to crushing and rescreening into ⅝-in and ¼-in stoker grades.

Ken Coal Co., Beaver Dam, Ky.—Contract closed with McNally Pittsburg Mfg. Co. for 500-tph stoker-coal crushing and screening addition, consisting of two 36x60-in McNally Pittsburg Gearmatic stoker-coal crushers to reduce 7x3, and 3x1¼-in minus; crushed resultant rescreened at ⅝ and ¼ in.

Middle Fork Coal Co., Middle Fork Mine, Paintsville, Ky. — Contract closed with McNally Pittsburg Mfg. Co. for 75-tph McNally Norton unit washer addition consisting of one No. 203 unit washing system with additional raw-coal crushing facilities consisting of one McNally Pittsburg double-roll crushers to permit crushing of 1-in plus to 1-in minus; normal crushed and raw 1-in minus are prescreened at ⅛ in with 1x¼-in washed at rate of 75 tph.

Riverview Coal Co., Hartford, Ky.—Contract closed with McNally Pittsburg Mfg. Co. for 250-tph raw-coal preparation plant consisting of r-o-m conveying, picking and crushing via 60x54-in McNally Pittsburg single-roll crusher; crushed resultant screened on 5x12-ft Allis-Chalmers screen producing stoker and screenings grades; final prepared coals loaded out on two loading tracks.

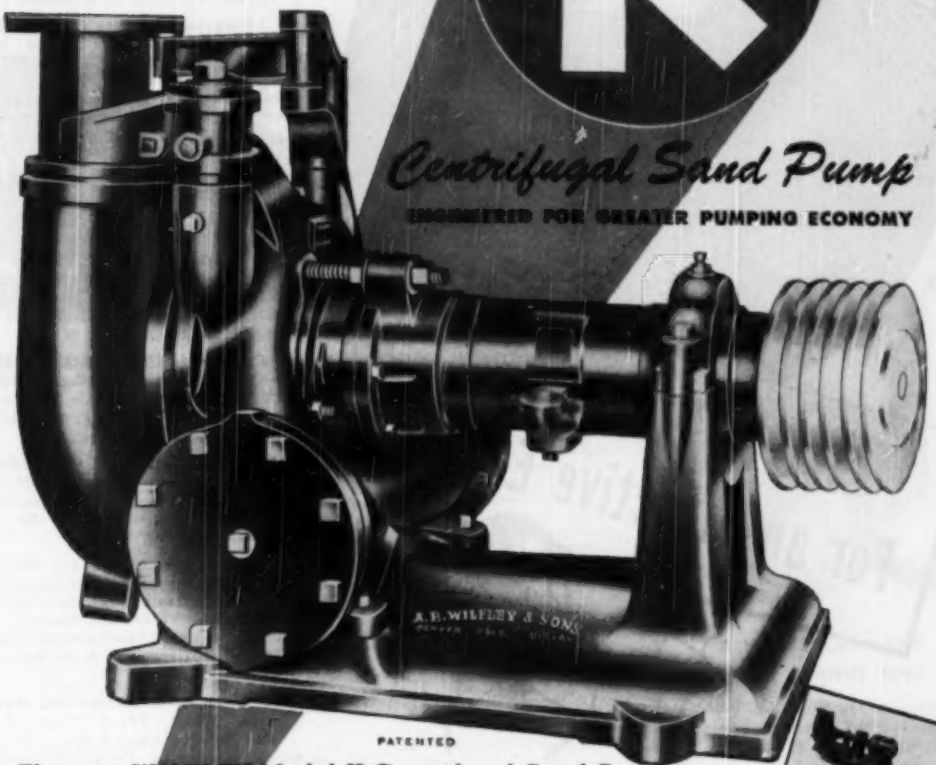
Lehigh Navigation Coal Co., Coaldale, Pa.—Contract closed with Wilmot Engineering Co. for two 6-ft-diameter Wilmot Hydrotators to prepare No. 4 coal, total feed capacity, 100 tph; and one 16-ft-diameter classifier to prepare No. 5 coal, feed capacity, 65 tph.

Hart & Hart Coal Co., Providence, Webster County, Ky.—Contract closed with Western Machinery Co. for one No. 4C Wemco Mobil-Mill using a 8-ft-dia by 6-ft long Wemco Drum Separator as the heavy-media separatory vessel; including engineering design for the new installation; feed capacity of plant, 150 tph, with approximately 125 tph of 6x¼-in coal to be washed in the Wemco Mobil-Mill unit and 25

New model K

Centrifugal Sand Pump

ENGINEERED FOR GREATER PUMPING ECONOMY



PATENTED

The new WILFLEY Model K Centrifugal Sand Pump features important mechanical improvements which give you substantial dollar savings—in power and production. This new pump delivers continuous, trouble-free operation—stepped-up production—dependable performance in handling sands, slimes or slurries. Individual engineering on every application—an economical size for every requirement. Write or wire for details.

Write for Wilfley Bulletin which details the special features, capacities, dimensions and other pertinent information.

BUY WILFLEY FOR COST-SAVING PERFORMANCE

WILFLEY
centrifugal PUMPS

A. R. WILFLEY & SONS, INC.
DENVER, COLORADO, U. S. A.
New York Office: 1775 Broadway, New York City

tph of ¼x0-in coal to be washed by tables being designed into the plant.

Alabama By-Products Corp., Praco mine, Praco, Ala.—Contract closed with Western Machinery Corp. for one No. 3C Wemco Mobil-Mill using a 6-ft-dia by 5-ft-long Wemco Drum Separator as the heavy-media separatory vessel; unit to initially treat 40 to 50 tph of 2½x¼-in jig middlings and at later date to be used for increased tonnage treatment of unwashed coal.

Livingston-Mt. Olive Coal Co., Livingston, Ill.—Contract closed with Western Machinery Co. for one No. 3C Wemco Mobil-Mill using a 6-ft-dia by 5-ft-long Wemco Drum Separator as the heavy-media separatory vessel; unit to wash approximately 60 tph of 4x¼-in coal.

Carrs Fork Coal Co., Allock, Ky.—Contract closed with Jeffrey Mfg. Co. for stoker coal plant; capacity, 150 tph.

Weirton Steel Corp., Weirton, W. Va.—Contract closed with Jeffrey Mfg. Co. for complete coal-washing plant, including 6-ft. Baum jig; capacity, 225 tph, 5x0 in.

Carbonifera Unida de Palau, Mexico—Contract closed by Allen & Garcia Co. with Jeffrey Mfg. Co. for 2-compartment diaphragm jig; capacity, 60 tph, 6x7/16 in.

West Kentucky Coal Co., Madisonville, Ky.—Contract closed with Jeffrey Mfg. Co. for 1-compartment diaphragm jig; capacity, 35 tph, middlings.

Princess Elkhorn Coal Co., Mine No. 2, David, Ky.—Contract closed with Robert Holmes & Bros., Inc., for one Baughman Verti-Vane thermal coal dryer to reduce moisture in ¼x0-in coal approximately 5% at feed rate of 35 tph.

Westmoreland Mining Co., Watson mine, White, Pa.—Contract closed with Robert Holmes & Bros., Inc., for one Baughman Verti-Vane thermal coal dryer to reduce moisture in ½x0-in coal approximately 5% at a feed rate of 60 tph.

Linton-Summit Coal Co., Regent mine, Sullivan, Ind.—Shipment by Deister Concentrator Co. of six Super-Duty Diagonal-Deck No. 7 coal-washing tables for cleaning ¼x0-in coal.

Templeton Coal Co., Jonay mine, Sullivan, Ind.—Shipment by Deister Concentrator Co. of six SuperDuty Diagonal-Deck No. 7 coal-washing tables for cleaning ¼x0-in coal.

Freeman Coal Mining Corp., Crown mine, Farmersville, Ill.—Contract closed with Roberts & Schaefer Co. for complete tipple and coal-preparation plant; capacity, 800 tph of r-o-m coal; including Jeffrey Baum Jig to clean 6x1½-in coal at the rate of 322 tph and R&S Super-Airflow cleaners for cleaning 1½x0-in coal at the ultimate capacity of 478 tph; tipple to be

THERE'S A NEW HIGHER STANDARD OF MINE LIGHTING!

WHEAT "FORTY-NINER" MINERS' ELECTRIC CAP LAMP

Only Wheat Lamps give you all these advantages

APPRECIABLE SAVINGS! The basic design of the Wheat equipment and the simplicity of its operation have reduced lamphouse maintenance to a fraction of the time and a fraction of the cost.

AUTOMATIC CHARGING! When placed on the charging rack, each lamp without manual attention takes only the amount of current necessary to re-charge it and can be left for days without overcharge—always ready for immediate use.

GREATER LIGHT OUTPUT! The Wheat "Forty-Niner" gives 25% more light with no change in battery size. Also important is the ability of the lamp to maintain a high percentage of its initial light efficiency at the end of the shift.

SIMPLE FOCUSSING ADJUSTMENT! A perfect spot is easily obtained within seconds by adjusting the headpiece cams.

RUGGED BATTERY JARS! "Forty-Niner" battery jars of incredibly impact-resistant Butalite withstand excessive abuse. Their "high-visibility yellow" color is an added safeguard for the wearer.

LIGHTWEIGHT! The Wheat "Forty-Niner" lamp complete weighs only 80 ounces. Battery and headpiece are small, compact and comfortably positioned for easy wearing.

NO BURNS FROM ELECTROLYTE! Injurious burns from electrolyte of the Wheat battery are unknown because the small amount of free solution is trapped by the spill-proof valve, even though the battery be turned over.

ATTRACTIVE SALES PLANS! There are several sales plans—both of outright purchase and deferred payment. Let us discuss them with you and help select the one most suited to your requirements.

A WHEAT LAMP FOR EVERY MINING JOB!

The Model "Q" is lighter in weight and smaller in size than the "Forty-Niner" while the Model "M" is larger and of even greater capacity. Each of the three models is specifically designed for its own particular field of operation and is capable of continuous full-shift performance. All models can be charged on the same rack and most of the parts are interchangeable.

Wheat Electric Cap Lamps are sold, installed and serviced exclusively by

National Mine Service Company

Ask for a demonstration! See for yourself how the Wheat "Forty-Niner" brings you a new, higher standard of mine lighting.

Has the facilities . . . Delivers the goods

BEMECO DIVISION Beckley, W. Va. | ALL-STATE DIVISION Logan, W. Va. | WHITEMAN DIVISION Indiana and Altoona, Pa. | KY. V.R. DIVISION Jenkins, Ky. | ANTHRACITE DIVISION Forty Fort, Pa. | WESTERN KY. DIVISION Madisonville, Ky.

Direct field representatives covering the major coal producing areas

provided for loading standard Illinois commercial sizes on seven tracks.

Clinchfield Coal Corp., Dante, Va.—Contract closed with Roberts & Schaefer Co. for R&S Super-Airflow unit for cleaning 50 tph of ¼x0-in coal.

Freebrook Corp., Ringgold, Pa.—Contract closed with Roberts & Schaefer Co. for Hydrotator coal-cleaning equipment for cleaning 80 tph of ¾x0-in coal.

Meadows Coal Co., Dawson Springs, Ky.—Contract closed with Roberts & Schaefer Co. for Hydro-Separator coal-cleaning equipment for cleaning 3x3/16-in coal; capacity, 125 tph.

Saginaw Dock & Terminal Co., Saginaw mine, St. Clairsville, Ohio—Contract closed with Nelson L. Davis Co. for 100-tph "Packaged Unit" heavy-media float-and-sink coal-cleaning plant to be installed adjacent to present facilities; to process 5x¼-in coal at any predetermined specific gravity within limits of 1.30 and 1.75.

New Developments

Controlling interest in the Perry Coal Co., St. Louis, has been acquired by the Midwest-Radiant Corp., it was announced last month. Operation and personnel of Perry Coal's St. Ellen mine, O'Fallon, Ill., will continue unchanged, with William R. Winters, general superintendent for Midwest-Radiant, in charge. The St. Ellen mine, which features a new 660-ft slope-belt installation (*Coal Age*, June, 1949, p 88) produces 2,500 tpd. A new washhouse now is under construction. In acquiring the Perry firm, Midwest-Radiant added a two-thirds interest to the one-sixth it had previously owned.

Peabody Coal Co., Chicago, announced last month that it had acquired sole ownership of the Black Mountain Corp., which operates two mines at Kenvir, Harlan County, Ky. In the transaction, Peabody reportedly added the stock owned by the Interlake Iron Corp. to the 67% interest it previously held.

Consolidation Coal Co. (Ky.), Div. of Pittsburgh Consolidation Coal Co., reportedly is re-opening its Burke Branch mine. The mine, which was originally opened several years ago, has been closed for some time. Shipments are made via the C. & O.

Clearbrook Coal Co., Chad, Ky., is opening a new deep mine planned for a capacity of 1,600 tpd. The Darby No. 5 seam will be mined and a new modern tipple and washery is being installed for shipments of all-stoker coal. W. L. Livingston is president of the company and the Central Fuel Co. will serve as sales agent.

A new 1,000-tpd deep mine is re-

portedly being opened by the Cove Fork Coal Co., Pikeville, Ky. The operation will mine the Elkhorn No. 2 seam and will ship from Hellier, on the C. & O.

Virginia Mining Co., Inc., Cambridge, Ohio, has recently opened the Carol No. 3 strip mine near Salesville, Ohio. The property has a capacity of 1,400 tpd from the No. 8 seam shipping via the B.&O.

Plans for mining of anthracite coal near Crested Butte, Colo., recently were announced by R. E. Simpson, general manager of the Slate River Mine Co., Alamosa, Colo., which operates an open-pit ore mine near the summit of the 13,400-ft Treasury mountain. His recently acquired anthracite field is located near the Crested Butte bituminous area, Mr. Simpson said.

A fire thought to have been started by a welder's torch in contact with a conveyor belt reportedly destroyed the tipple at the Dawson mine of the Barnes-Dawson Coal Co., near Clarksburg, W. Va., early last month. The damage was estimated at $185,000, including $35,000 of new equipment that was being installed. The company is a subsidiary of the Bird Coal Co., Philadelphia.

Interior Department Sets Defense Administration

Establishment of a Minerals and Energy Administration within the Department of the Interior to administer the defense responsibilities delegated to the department under the Defense Production Act of 1950 was announced Sept. 27 by Secretary of the Interior Oscar L. Chapman.

Secretary Chapman will be administrator of the new administration, which will be made up of four industry agencies. Each agency will be headed by an assistant administrator, to carry out operating functions in each of the areas for which the Interior Department has responsibility, including electric power, petroleum and gas, solid fuels, and metals and minerals.

Defense activities in the field of solid fuels are to be handled, for the present, by Dan H. Wheeler, who has been assistant director of the department's Division of Territories since last May. Mr. Wheeler has worked for the Department of the Interior since 1939, serving successively as assistant director and director of the Bituminous Coal Division, assistant deputy and Deputy Solid Fuels Administrator for War, and assistant director of the Department's Program Staff. James Boyd, Director of the Bureau of Mines since 1947, has been appointed to head the Metals and Minerals Agency.

George Lamb, assistant to the president of the Pittsburgh Consolidation Coal Co., has been appointed a consultant to Secretary Chapman to aid in organizing a staff to administer defense functions in the solid fuels

Typical Bethlehem prefabricated track layout for room-and-pillar system.

The savings are real with BETHLEHEM PREFABRICATED TRACK

We're talking now to the dollar-minded executive who wants to save money in chunks. He can do it with Bethlehem prefabricated track—and, at the same time, assure himself of a top-notch haulage system right up to the working face.

Here are two common ways in which this track accounts for solid savings:

(1) *You save time.* A Bethlehem prefabricated layout can be installed by unskilled labor in one-third the time required by trained track men who cut and bend rail in the field. This figure is conservative. Reason: Bethlehem prefabricated track is tailored to the individual mine, and all rails are precurved to proper radii and cut to proper length before shipment.

(2) *You save material.* Since the rails are precut to the exact lengths needed, there is no wastage —not an inch of it. This is rarely true when mines do their own cutting. And even when a mine avoids rail wastage by using cut-off pieces, there's always the matter of joints. Making a good joint takes time . . . labor. Bethlehem prefabricated track means a 10 to 15 pct cost saving in these phases of operation. Here again the figures are conservative.

Ask a Bethlehem man to call on you and give you more details. There are so many ways in which prefabricated track can save you money; savings that should never be overlooked. If you'd like to hear the full story, just say when.

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BETHLEHEM STEEL

field. Mr. Lamb was assistant director of the Bureau of Mines from 1945 to 1947 and had previously been chief economist for the department's Bituminous Coal Division.

Early in October, Secretary Chapman announced the appointment of Charles W. Connor, of Charleston, W. Va., as a consultant to aid in organizing a defense solid fuels agency within the department. Mr. Connor, a mining engineer, is widely known throughout the industry. From 1927 until he retired last July, Mr. Connor was in charge of coal operations for the Armco Steel Corp. at Montcoal, W. Va. Prior to his association with Armco, Mr. Connor was superintendent of mines for the Solvay Colliers Co. and was general manager of the R. R. Smith Coal Co. He has been serving as mining consultant since his retirement from Armco.

NEWS IN BRIEF

"The World's Longest Coal Train" was a feature of the week-long celebration of the opening of the New York Central's new station in Toledo late in September. The 206-car train was almost 2 mi long and carried 15,000 tons of coal from Ohio and West Virginia.

Coal fatalities are continuing their downward trend in the first 8 mo of 1950, according to USBM figures. Bituminous fatalities were 1.09 per million tons in 1950, compared with 1.12 in the first 8 mo of 1949. In anthracite, the rates for 1950 and 1949 were 1.74 and 2.01, respectively. For both industries, the 1950 rate was 1.14, and 1.20 in 1949.

The Blue Diamond Coal Co., through its president, Alexander Bonnyman, has increased its four scholarships in mining at the University of Kentucky awarded during 1949 to six for the 1950-51 school year. Students are selected from the communities in which the company operates.

The world's first coal-burning gas-turbine locomotive was completed last month and shipped to the Dunkirk, N. Y., plant of the American Locomotive Co. for testing. Built by Allis-Chalmers, the unit is being developed as a project of the Locomotive Development Committee of BCR (*Coal Age*, May, 1950, p 79). If stationary tests go as expected, plans call for extensive road tests next spring.

The bituminous coal industry will require 1,000,000 tons of steel within the next 12 mo, the National Bituminous Coal Advisory Council announced Oct. 13. Its estimate is based on returns of a survey of mining companies throughout the country.

A series of 26 special posters on safe practices in underground coal mines will be produced by the National Safety Council, providing it receives the necessary support from the industry. The two-color posters will be

available at $2.50 to $4.00 a set, depending on the quantity ordered, and inquiries should be addressed to the Coal Mining Section, NSC, 425 N. Michigan Ave., Chicago 11.

1,641,276 household gas-heating installations are anticipated during the next 3 yr, according to a survey recently completed by the American Gas Association. The group found that as of April 1, 1950, there were 7,217,224 gas-heating household customers in the U. S. About half of the anticipated installations are expected to go into new dwellings, with the other half representing conversions from other fuels.

The Baltimore & Ohio R.R. Co. announced last month that it had made a lease agreement with the Equitable Life Assurance Society for the purchase of 90 diesel-electric units that will increase its present diesel fleet by 22%.

Columbia University has announced the availability of several $1,000 scholarships at its School of Mines. The grants, presented by Henry Krump, also include traveling expenses to New York and are to be awarded on the basis of ability.

John L. Lewis and two other trustees of the UMWA Welware and Retirement Fund were ordered by a federal judge Oct. 23 to pay William L. P. Burke, a lawyer, for his work in defending them in two suits. Mr. Burke originally sued for $50,000 (*Coal Age*, October, p 168), but later cut his demand to $35,000. Mr. Lewis is reported to have offered $15,000. The judge appointed a special master to fix the amount.

A **$35,000 grant** for research on coal mine acid drainage has been approved by Pennsylvania Gov. James H. Duff. The fund provides for the establishment of an industrial fellowship at the Mellon Institute in Pittsburgh.

A **graphic illustration** of government's place in the American scene was presented before the opening

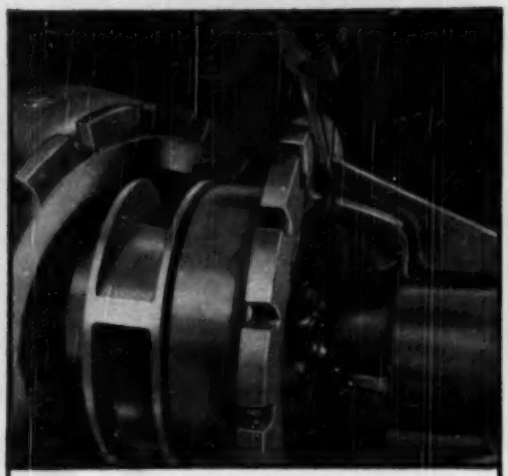
65 NEW PRODUCTS . . .

OR CATALOGS are described in this month's New Equipment section starting on p 114. Have you checked through them—or are you missing a good bet that may help you jack output and cut operating costs? The handy postcard facing p 124 will bring you more dope on any of them—without obligation. It's there for your convenience.

Remove Rotating Element in 5 Minutes!

ALLIS-CHALMERS COAL WASHING PUMP

1. Remove Casing Bolts lift and disconnect drive. Just loosen bolts and bolt assembly from slot. Bolt, nut and washers are still connected for easy reassembly.



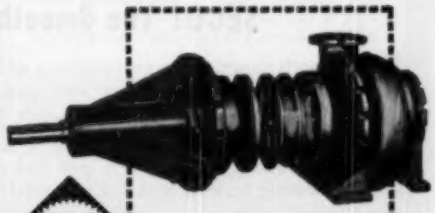
2. Swing Out Rotating Element. Neither suction nor discharge piping need be disturbed. All wearing parts are fully accessible for inspection or servicing.

THE PUMP IS BACK IN SERVICE IN LESS THAN A HALF HOUR

QUICK, EASY SERVICE AND LONG RUNS between servicings are the two things operators want most in coal washing pumps. You can see for yourself how quick and easy service is with an Allis-Chalmers Coal Washing pump.

You get long life, too, because Allis-Chalmers Coal Washing Pumps are made of special hard *Allisite* alloy . . . because they have thick sections and heavy parts throughout . . . and because they are application engineered by specialists who know coal washing problems and how to solve them.

Get complete information on Allis-Chalmers Coal Washing pumps from your nearest Allis-Chalmers Sales Office. Or write for Bulletin 08B6381. ALLIS-CHALMERS, 968A SO. 70 ST. MILWAUKEE, WIS. A-3215



ONLY FIVE WEARING PARTS
Shaft sleeve, impeller, casing, two wear plates. All easy to handle and easy to replace.

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session of the Council of State Chambers of Commerce by W. H. Harnischfeger, president of the Harnischfeger Corp. Using a colored sound film, "The Fourth Man," Mr. Harnischfeger showed how three mythical characters, "Yo," the business man, "Heave," the worker, and "Ho," the farmer, worked together and prospered, finally hiring themselves a fourth man, called "Government," to handle community matters. The fourth man grew so big that he was running their lives, but he still wasn't too big to be replaced, the three who were paying the bills decided. In ending his story of "The Fourth Man," Mr. Harnischfeger pointed out that too many people were talking about doing something, but that no one was doing anything. The film is available from Swank Films, Dayton, Ohio.

Among the railroads reporting plans for the purchase of new coal cars, the B. & O. announced Oct. 9 that it was awaiting bids on 2,000 steel hopper cars. The Pennsylvania has placed an order with the ACF for 1,200 52½-ft gondolas, it was announced Oct. 3. The New York Central announced Oct. 16 the purchase of 7,000 new freight cars, including 3,000 hoppers and 1,500 gondolas.

Harlan Meet Decides Ky. Safety Champions

The Republic Steel Co.'s team took top honors in mine rescue and the Closplint team of Consolidation Coal Co. (Ky.) placed first in the first aid competition in the Kentucky state championship meet held in Harlan Oct. 6-7. Championship trophies for the two contests were presented by the Mine Safety Appliances Co. and the National Coal Association, respectively. Second place in the first aid contest was won by Mine No. 204, Consolidation Coal Co. (Ky.), which received a cup presented by the Coal Operators' Casualty Co.

In the colored division, the Aflex, Ky., team of the Leckie Collieries Co. placed first, winning a cup presented by the Bituminous Casualty Co. The David team of the Princess Elkhorn Coal Co. won the championship in the boys' division. The girls' first aid team of the Inland Steel Co., Wheelwright, Ky., the only such team entered, also demonstrated its first aid training.

Fox Named Editor of Mining Congress Journal

John C. Fox has been named editor of *Mining Congress Journal*, to succeed Sheldon P. Wimpfen who has resigned to join the raw materials operations of the Atomic Energy Commission, where he will be engaged in special problems of uranium production.

Mr. Fox, who most recently has

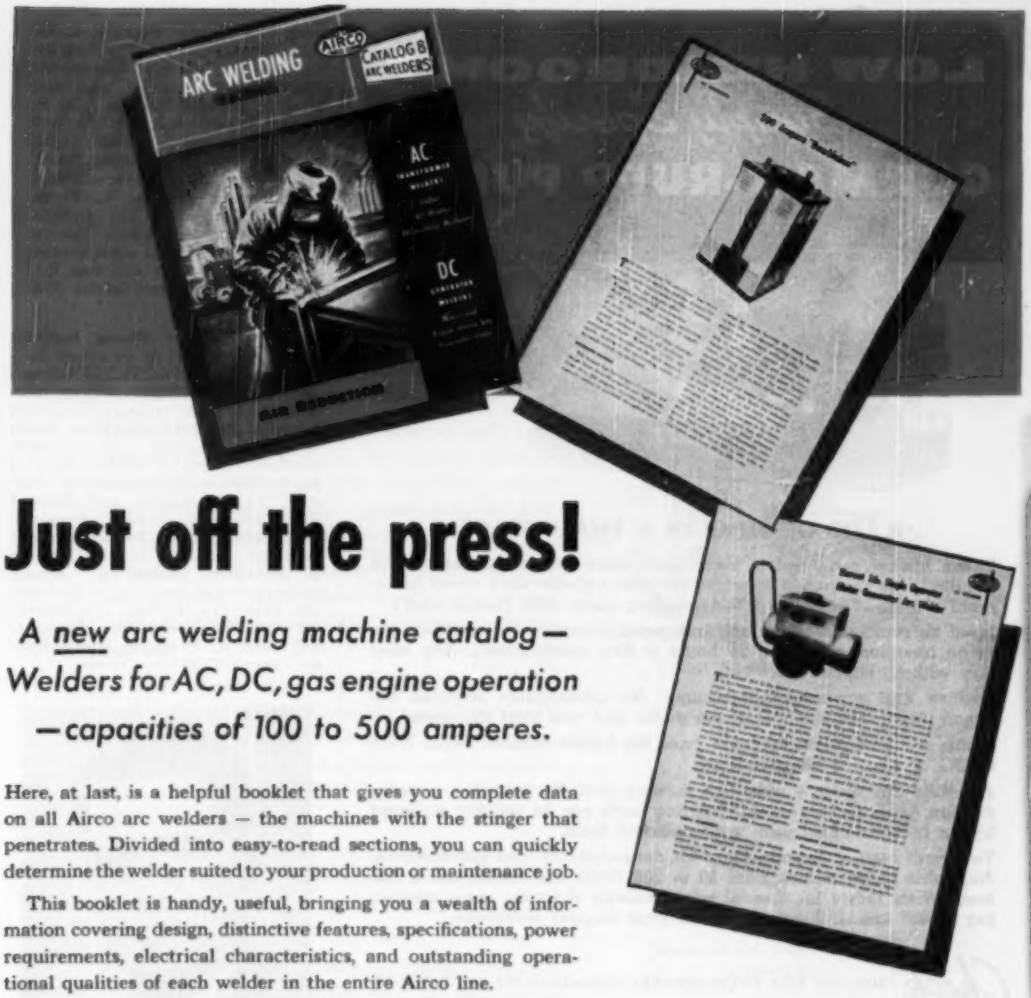
been a member of the faculty of the School of Mines, Columbia University, of which he is a graduate, has a broad experience in various phases of mining and in technical writing. He has worked as an engineer and in other positions with a number of metal-mining companies and has served as a technical representative on explosives in various coal fields. He also has done mine-consulting work, has written for the *American Metal Market* and was author of the "New York Letter" of the *Canadian Mining Journal.*

Association Actitvities

Appalachian Coals, Inc., has elected Gordon Bonnyman, an executive and director of the Blue Diamond Coal Co., a member of its board of directors.

Kanawha Coal Operators' Association, Charleston, W. Va., at its 49th annual meeting held at the Kanawha Country Club Oct. 19, elected Charles C. Dickinson Jr., president to succeed L. N. Thomas. A. L.Wilson was named vice president. Harry G. Kennedy, executive secretary, and John L. Dickinson, treasurer of the association for more than 40 yr, were re-elected to those posts. Speakers at the meeting included Julian Tobey, president, Appalachian Coals, Inc.; Joseph E. Moody, president, Southern Coal Producers' Association; and John D. Battle, executive vice president, NCA.

New River Coal Operators' Association, at a meeting held Oct. 11 in Mt. Hope, W. Va., elected S. Austin Caperton, president of the Slab Fork Coal Co., as president to succeed J. M. McCauley, general manager of The New River Co. Other officers named were: vice president, L. C. Campbell, vice president, Eastern Gas & Fuel Associates; secretary and labor commissioner, S. C. Higgins; and treas-



Just off the press!

A new arc welding machine catalog— Welders for AC, DC, gas engine operation —capacities of 100 to 500 amperes.

Here, at last, is a helpful booklet that gives you complete data on all Airco arc welders — the machines with the stinger that penetrates. Divided into easy-to-read sections, you can quickly determine the welder suited to your production or maintenance job.

This booklet is handy, useful, bringing you a wealth of information covering design, distinctive features, specifications, power requirements, electrical characteristics, and outstanding operational qualities of each welder in the entire Airco line.

To give you some idea of the amount of material covered by this definitive booklet, here are a few of the many welders covered.

- "Bumblebee" and MCT — Transformer AC Arc Welding Machines
- "Hornet" 36A and "Wasp" — DC Arc Welding Machines
- "Yellow Jacket" Gas-Engine Driven Arc Welders
- Customer-Assembled Gas Engine Sets

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urer, P. M. Snyder, EG&FA. L. Ebersole Gaines, president, The New River Co., and J. W. Garvey, vice president, Maryland-New River Co., were elected directors of the Southern Coal Producers' Association. J. M. McCauley, S. C. Higgins and C. R. Stahl, EG&FA, were named members of the board of arbitration. Elected members of the scale committee were: L. Ebersole Gaines, J. W. Garvey, L. C. Campbell, S. C. Higgins, S. Austin Caperton, J. F. Hunter, general superintendent, Scotia Coal & Coke Co., and R. H. Morris, vice president, Gauley Mountain Coal Co.

Moshannon Coal Mining Institute elected new officers at its annual banquet held in Altoona, Pa., as follows: president, Harry Adam, mine superintendent, Dexter-Carpenter Coal Co., Beccaria, Pa.; vice presidents, James W. George, Rockhill Coal Co., Robertsdale; Robert J. Emigh, general superintendent, Morrisdale Coal Mining Co., Morrisdale; and Edward Girod, Clearfield; secretary-treasurer, J. C. Dobey, Rockhill Coal Co.; and assistant secretary-treasurer, David B. Millward, Philipsburg. Among those re-elected directors of the institute were: John Helman, superintendent, Imperial Coal Corp., Coalport; and John E. Foreman, superintendent, Argyle Coal Co., Cresson.

Franklin H. Mohney, of Brookville, Pa., has been appointed executive secretary of the Mineral Producers' Association, Kittanning, Pa., succeeding Robert T. Laing, who recently resigned to join the Central Pennsylvania Coal Producers' Association.

Prior to his new appointment, Mr. Mohney was educational program director with the U. S. Army Air Forces in Ashiya, Japan. At the outbreak of World War II, he enlisted in the Army and served as a captain in anti-aircraft Artillery. Upon his release from the army, Mr. Mohney did graduate work at the University of Pennsylvania and the University of Pittsburgh.

Lower your costs with these *McCarthy* shot-hole *Drills*

● McCarthy Blast Hole Drills bore shale and rock formations to produce deeper and truer blast holes in less time with less effort.

McCarthy Drills have heavier, more ruggedly built frames, with finger-tip controls, heavy-duty transmissions and alloy steel gears and shafts. Each unit is provided with an abundance of power, supplied from gasoline, diesel or electric motors.

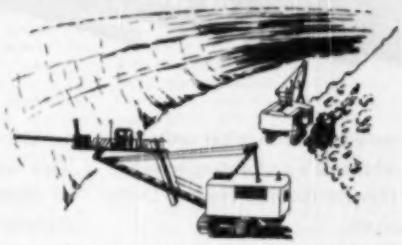
Simplified designing permits increased mobility of both horizontal and vertical models . . . makes McCarthy the favorite in the field . . . the top performer of them all!

For high speed, high level drilling, there's the McCarthy Horizontal Drill for mobile mounting; there's a Self-Propelled, highly maneuverable unit for drilling blast holes close to the floor or bottom; and a compact, powerful Vertical Drill with a hydraulic tower that folds flat for travel.

Each of these McCarthy Drilling Units was developed for a specific job. Rigid tests prove conclusively that McCarthy Drills produce more footage at less cost than any other drills on the market.

Make the Salem Tool Company headquarters for all your drilling needs. Write now for information about how McCarthy Drilling equipment can increase your production and lower your blast hole drilling costs.

Vertical Drill Mounted on Half Track



Horizontal Blast Hole Drill Mounted on Shovel Boom

Truck Mounted Blast Hole Drill

Self-Propelled Blast Hole Drill

Vertical Blast Hole Drill

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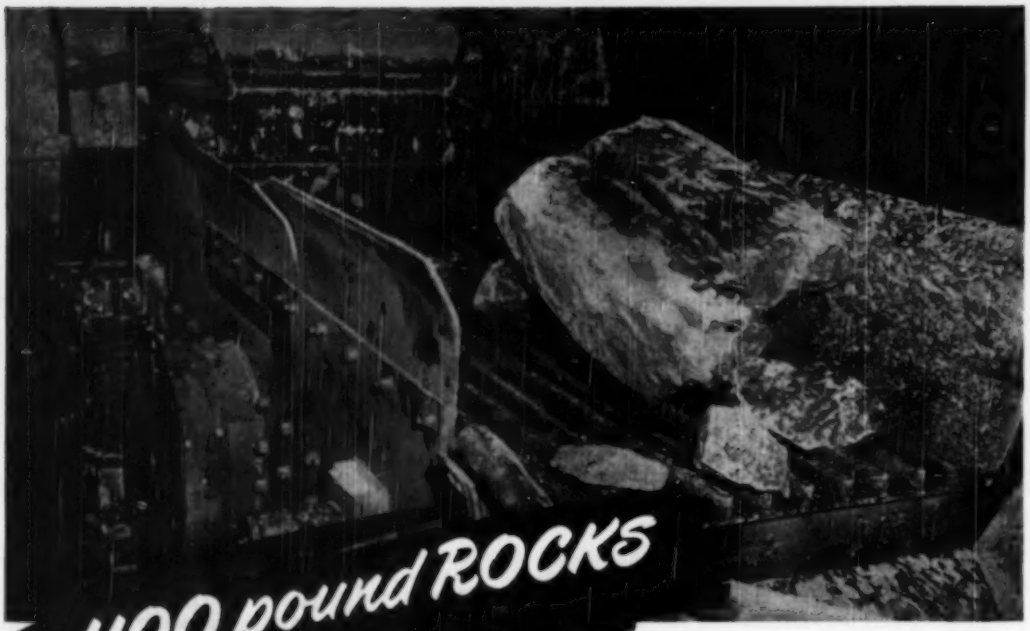

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Take a look at that big brute of a machine. It's a vibrating screen—a Hewitt-Robins Heavy Duty Scalper.

The big rock you see on its deck is a 3′ x 2′ x 1½′ lump of ore weighing about 1100 pounds. The Scalper handles loads like this at 1000 tons an hour. Yet, it absorbs those loads—and its own vibration—so completely that a coin placed on edge on the base beams will stand up without toppling over *while the machine is running!*

The same company that makes this big brute also makes a small screen called a Ceramic Slip Lawn. This lawn is so precise in action, so effective in operation, that it finds and removes tiny specks of impurities—about ½ pound in every ton of material—from clay slip for pottery plants.

Think of that range—from 1100 lb. rocks to tiny specks! It's the best proof of all that Hewitt-Robins can satisfy *your* vibrating screen demands!

Just look at these facts: Hewitt-Robins originated the circle-throw principle for vibrating screens. Hewitt-Robins created the elliptical throw. Hewitt-Robins pioneered in both 4-bearing and 2-bearing vibrators. Hewitt-Robins introduced the full-floating principle of vibration-absorption.

Whatever you want in vibrating screen equipment, you can *safely* rely on Hewitt-Robins. Tell us your needs; we will supply the answer. Write to Robins Conveyors Division, 270 Passaic Ave., Passaic, N. J.

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TOP HONORS in the white and colored divisions of the 19th annual Kanawha Valley safety meet were taken by these teams, both from the Semet Solvay Div., Allied Chemical & Dye Corp., Longacre, W. Va. In the white division competition, the winning team (top), chalked up a perfect score.

Kanawha Valley Institute Holds 19th Annual Safety Meet

First prize in the white division of the 19th annual safety meet of the Kanawha Valley Mining Institute, held at Montgomery, W. Va., Sept. 23, went to the team from the Semet Solvay Div., Allied Chemical & Dye Corp., Longacre, W. Va., which topped the meet with a perfect score—1,500 points out of a possible 1,500. Second place was taken by the team of Electro-Metallurgical Div., Carbide & Carbon Chemicals Corp., Alloy, W. Va., third by the Mile Branch Coal Co., Cedar Grove, and fourth by the Riverton Coal Co., Crown Hill. Teams from the Cannelton Coal & Coke Co., Cannelton, and Eastern Gas & Fuel Associates, Elkridge, tied for fifth.

In the colored division, final ranking of the teams was: first, Semet Solvay Div., Longacre; second, Eastern Gas & Fuel Associates, Powellton; and third, E. G. & F. A., Elkridge.

In the boy's section, the team repre-

COAL MEN ON THE JOB

BETHLEHEM FAIRMONT COAL CO., Scott No. 2 mine, Shinnston, W. Va.: Arch Ruble (left), James Ashcraft and John Sterling, section foremen; Harry Turner, night mine foreman; and Glenn Heflin, section foreman.

sented Semet Solvay Div., won first prize, and that of the Hatfield Campbells Creek Coal Co., Rensford, was second. In the girl's section, with two teams competing, the winner was that of the Hatfield Campbells Creek Coal Co., and the runner-up that of the Riverton Coal Co.

Large cash prizes were awarded to individual members of the winning teams. First prizes to men's team were $50 each; second, $25; third, $20; fourth, $15; and fifth, $10. In the girl's and boy's sections, members of the winning teams received $20 and those placing second, $10 each.

The safety meet was especially planned to be a big day in Montgomery. It started with beauty contests for white and colored girls, followed by a parade of the beauties, bands, first aid teams and floats. After the contest, stubs of tickets sold to finance the meet were shuffled and a drawing conducted. Principal prizes to the lucky holders consisted of a Chevrolet, a Ford, Plymouth, an electric refrigerator, electric stove, washing machine, radio, two shot guns and two cash awards of $50 each.

Joe Mulligan, safety director, Semet Solvay Div., was director of the meet. Major A. W. Fluegel is president of the institute and Lee M. Morris is secretary.

Three Safety Contests Reported in Kentucky

First aid teams from Consolidation Coal Co. (Ky.) competing with 12 other white teams at the annual safety day sponsored by the Big Sandy-Elkhorn Coal Mining Institute, Pikeville, Ky., Sept. 29-30, won first and second places. Warnie Flint, Jr., captained the Mine 214 team, which finished first, and Blaine Sexton headed the second place team from Mine 204. Third was won by a team from Martin mine of the Utilities Elkhorn Coal Co., captained by I. C. Peters.

Three colored teams competed, finishing in the following order: Inland Steel Co., J. T. Miller, captain; Mine 204, Consolidation Coal Co. (Ky.), Clyde Cummings; and Mine 214, Consolidation Coal Co. (Ky.), Roy Gray.

Two teams competed in the girls' class and two in the boys' class. Girls' teams and their captains were: first, Inland Steel Co., Ann Parker; second, Princess Elkhorn Coal Co., Jean Clark. Boys' teams: first, Princess Elkhorn, Loyal Hager; and second, Inland Steel Co., Hugh Cannon.

In a mine rescue contest using 2-hr. apparatus, a team from the Republic Steel Corp., captained by Eddie Howe, made the best showing. The other three teams finished in this order: Mine 204, Consolidation Coal Co. (Ky.), Raymond Wetzel; Inland Steel Co., Willie Rainey; and Eastern Gas & Fuel Associates, Clyder Adkins.

Two teams competed with Chemox apparatus, Princess Elkhorn Coal Co., Virgil Howard, taking first; and Mine

The "pick" of the miners... and the majors!

DODGE trucks are "Job-Rated" to cut costs!

"Job-Rated" ...for low cost transportation

POWER: . . . 8 great truck engines—each *"Job-Rated"* for *PLUS* power.

ECONOMY: . . . priced with the lowest. *"Job-Rated"* for dependability and long life.

BIGGER PAYLOADS: . . . carry more without overloading axles or springs because of *"Job-Rated" WEIGHT DISTRIBUTION.*

EASIER HANDLING: . . . sharper turning! Parks in tight places. *"Job-Rated"* maneuverability!

COMFORT: . . . widest seats . . . windshield with best vision of any popular truck. Air-cushioned, adjustable "chair-height" seats.

SAFETY: . . . finest truck brakes in the industry . . . hand brake operating independently on propeller shaft on *all* models—½-ton and up.

If you want to save on hauling costs, you want trucks that are built to fit your job. You need Dodge *"Job-Rated"* trucks.

Your Dodge *"Job-Rated"* trucks will have every unit, from engine to rear axle, sized right for hauling your loads over your roads. Engines will be *"Job-Rated"* to give you plenty of power with top-notch economy. You'll save on gas, oil and upkeep, too!

And remember, it's a long haul between overhauls with Dodge *"Job-Rated"* trucks.

So take a good look at the Dodge *"Job-Rated"* truck advantages listed here. Then, ask your Dodge dealer to show you a truck that will haul your coal at lower cost per ton-mile!

With all their extra value **DODGE** "Job-Rated" **TRUCKS** are priced with the lowest

214, Consolidation Coal Co. (Ky.), Curtis Dorton, second.

Prize money awarded the teams totaled $1,780. For holders of tickets sold to finance the meet, the principal prizes were an automobile, a boat with outboard engine and a bicycle.

The mining institute sponsored the safety day with the cooperation of the Kentucky Department of mines, Big Sandy-Elkhorn Coal Operators' Association, UMWA and the USBM. J. H. Mosgrove is secretary of the institute. Directors of the meet were James Benson, USBM, Birmingham, Ala., A. D. Sisk, chief, Kentucky Department of Mines & Minerals, and Earl Maize, director of safety, NCA. Supervisors were G. E. Reed and W. R. Park, both of the USBM, Norton, Va. E. E. Quenon, supervising engineer, USBM, Mt. Hope, W. Va., was chief judge for both the first-aid and mine-rescue contests.

Teams from the Pond Creek Colliery of the Mining Department, Norfolk & Western Ry., took both first and second places in the first aid contest held at the Red Robin ball park, Stone, Ky., Sept. 16, under the sponsorship of the Pond Creek-Tug River Mining Institute. A mine rescue contest was held in the morning and the first aid contest at night. Near a record crowd was in attendance.

In the mine rescue competition first place was won by a team from Mine No. 8, Eastern Coal Corp., with Harold Brogan as captain. Second place went to a team from Mine No. 7 of the same company and captained by Roy Alexander.

In the colored-division first-aid contest, the winner was a team from Aflex Mine of the Leckie Collieries Co., Aflex, Ky.

More than 1,000 persons attended the mine-rescue and first aid meet held Sept. 22-23 at Madisonville, Ky., by the Western Kentucky Mining Institute. Winning teams were reported as follows:

Mine rescue: first, Poplar Ridge Coal Co., Sturgis; second, Pleasant View mine, West Kentucky Coal Co.; third, East Diamond mine, West Kentucky Coal Co.

First aid: first, Oriole mine, Bell & Zoller Coal & Mining Co.; second, Poplar Ridge Coal Co.; and third, W. G. Duncan Coal Co.

Colored division: first, Poplar Ridge Coal Co.

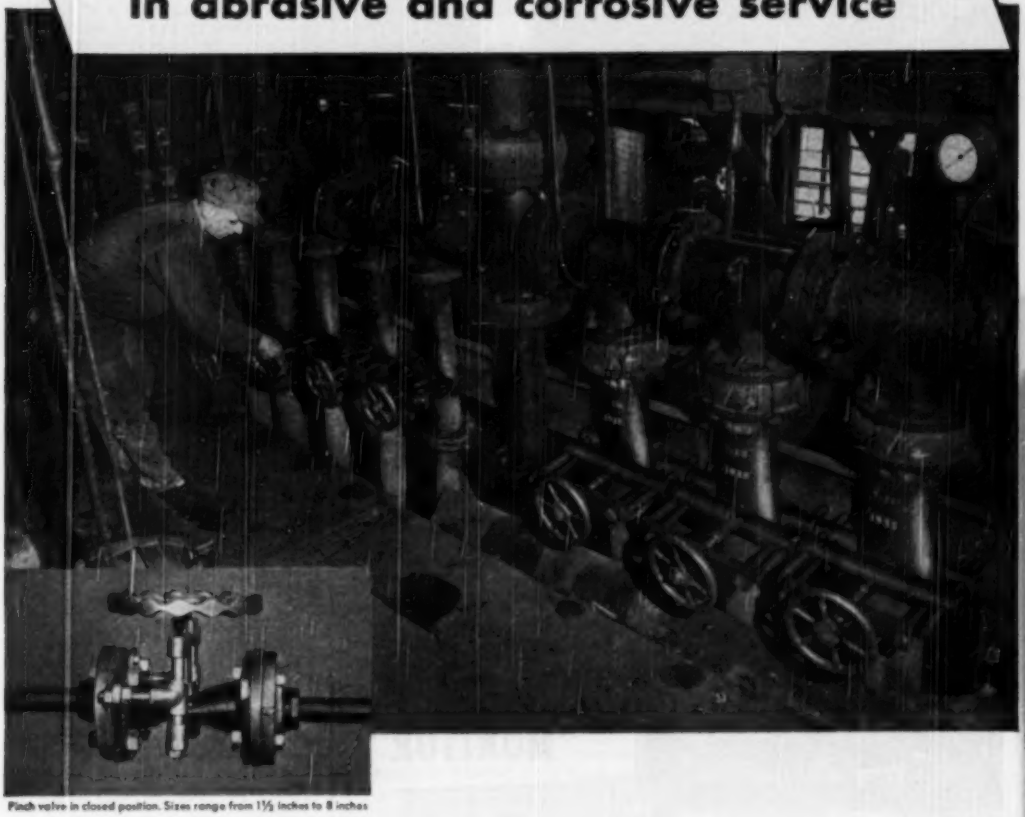
Potter Heads Committee For AMC 1951 Coal Meet

Dr. Charles J. Potter, president, Rochester & Pittsburgh Coal Co., Indiana, Pa., has accepted the chairmanship of the National Program Committee for the 1951 Coal Convention and Exposition of the American Mining Congress to be held at Cleveland, May 14-17.

A graduate of the University of Missouri, Dr. Potter during World War II was Deputy Solid Fuels Ad-

NEW FLEXIBLE VALVE OUTWEARS METAL

in abrasive and corrosive service



Pinch valve in closed position. Sizes range from 1½ inches to 8 inches

Above you see a series of "U. S." rubber pinch valves controlling the flow of water containing abrasives in a Pennsylvania coal preparation plant. Many of them have been in continuous operation for 15 years. In the inset is the *newest* in the U. S. Rubber family of pinch valves.

This new pinch valve, developed by United States Rubber Company technicians, outwears metal when installed in pipe lines carrying abrasive or corrosive mixtures. Its flexibility offsets misalignment in pipes, absorbs vibration, breaks up galvanic action in pipes, eliminates "water hammer" and offers a positive seal in a closed position. The metal parts of the valve can be refitted to new valve bodies, thereby reducing replacement costs.

These "U. S." pinch valves are available in abrasive and corrosive-resistant compounds, neoprene for oil resistance, butyl rubber for high heat and severe acid conditions and pure gum stock for food and beverage conveyance. Design of the valve is very compact, retaining rings and pinch valve body in one unit, an advantage for installations where space is limited. Write to address below.

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UNITED STATES RUBBER COMPANY

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ministrator and Deputy Coal Mines Administrator from 1943 to 1945, and in 1946 received the Medal for Merit from the President for his excellent work in these capacities.

The National Program Committee named to serve with Dr. Potter includes outstanding leaders of the coal industry from all parts of the country, together with representative manufacturers of mining machinery and supplies.

The Committee will meet in Pittsburgh, Pa., early in November to develop plans for the 1951 Convention. Paramount consideration will be given to means by which the coal industry may do its part in meeting the needs of the country and supporting fully the national defense program. Consideration will be given to obtaining the necessary equipment and supplies to maintain coal production, to increasing efficiency in mine operation through development and application of improved operating practices, to intensified manpower problems and to increased safety in the mines.

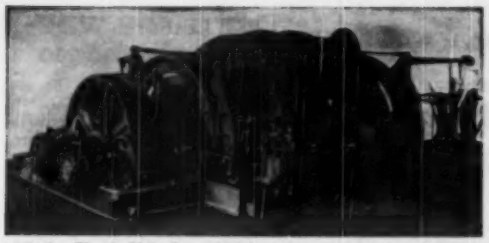
Membership of the committee consists of:

C. J. Potter, national chairman, Rochester & Pittsburgh Coal Co.; E. M. Arentzen, Lee-Norse Co.; David T. Beals III, Crowe Coal Co.; Wm. Beury, Algoma Coal & Coke Co.; K. R. Bixby, Bixby-Zimmer Engineering Co.; W. A. Borries, Dawson Collieries, Inc.; Nelson L. Davis, Nelson L. Davis Co.; H. A. Dierke, Glen Alden Coal Co.; W. L. Doolittle, Consolidation Coal Co. (W. Va.); J. S. Forman, Mt. Olive & Staunton Coal Co.; H. D. Foster, Goodyear Tire & Rubber Co.

J. H. Fulford, Jeffrey Mfg. Co.; C. A. Gibbons, Susquehanna Coll. Div., M. A. Hanna Co.; Wm. E. Goodman, Goodman Mfg. Co.; C. A. Hamil, Sycamore Coal Co.; A. K. Hert, Snow Hill Coal Corp.; E. M. Heuston, Bucyrus-Erie Co.; J. P. Horne, Jewell Ridge Coal Corp.; Anton Hulman, Princeton Mining Co.; S. B. Johnson Jr., Lorain Coal & Dock Co.; J. M. Kerr, Berwind-White Coal Mining Co.; R. E. Kirk, T. C. I. & RR Co.

Frank E. Mueller, Roberts & Schaefer Co.; J. T. Parker, Inland Steel Co.; F. S. Pfahler, Superior Coal Co.; C. A. Peterson, Northwestern Mine & Exchange Co.; E. M. Platts, Joy Mfg. Co.; H. A. Reid, United Electric Coal Cos.; H. C. Rose, Pittsburgh Coal Co.; A. J. Ruffini, North American Coal Corp.; John T. Ryan Jr., Mine Safety Appliances Co.; J. H. Sanford, Ohio Brass Co.; L. G. Schraub, Union Wire Rope Corp.

Chester Sensenich, Irwin Foundry & Mine Car Co.; Van B. Stith, Anchor Coal Co.; R. A. Swallow, Ayrshire Coal Co.; L. J. Walker, Chicago Pneumatic Tool Co.; J. W. Wetter, Rockhill Coal Co.; Frank White, Peabody Coal Co.; H. B. Wickie, Pennsylvania Coal & Coke Corp.; R. Y. Williams, consulting engineer, Pottsville, Pa.; W. A. Wirene, General Electric Co.; T. R. Workman, West Virginia Coal & Coke Corp.; and W. P. Young, Bell & Zoller Coal & Mining Co.



1750 hp. Electric Hoist for coal-mining company. Cylindro-conical tight-and-loose drums are each 9 to 13 ft. in diameter; grooved for 1676 ft. of active 1⅝" rope. Equipped with air-operated brake and clutch engines and modern safety devices that provide dependable protection against any damage that might be caused by current failure, overwinding or overspeeding.

600 hp. Electric Hoist for metal-mining company. Cylindrical drums are each 7 ft. in diameter; grooved for 2650 ft. of active 1⅛" rope. In addition to post-type brakes, oil-hydraulic brake and clutch engines and modern safety devices, this hoist is equipped with a system of dynamic braking that assures important savings in both operating and maintenance expense.

Vulcan "Alkasteel" Sheave on modern head-frame. Besides being light and very strong, Vulcan Alkasteel sheaves are so highly resistant to rope wear that NO LINERS ARE NEEDED. Available in a wide range of types and sizes with either plain or anti-friction bearings.

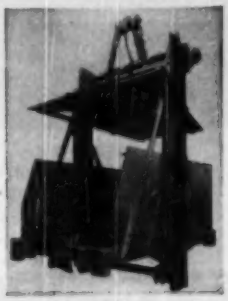
MINING EQUIPMENT

with a 101-Year Record of Satisfactory Service

Located in the heart of the anthracite field, the Vulcan Iron Works has been building dependable mining equipment since 1849, taking full advantage at all times of every approved advance in design, materials and manufacturing methods. Unsurpassed facilities and a long-established policy of sturdy construction assure prompt deliveries and satisfactory service at lowest ultimate expense.

So many problems have been solved successfully during this long period of service to mining companies throughout the United States and many other countries that most requirements can now be taken care of successfully by utilizing some well-proved design with little or no modification. Our experienced engineers are always ready, however, to cooperate with the purchaser in the development of a new design to meet his particular operating conditions.

Write us regarding any requirement within the wide range of equipment listed below. We welcome opportunities to make helpful suggestions without charge or obligation. Bulletins on request.



Self-Dumping Cage for high-speed hoisting in a coal mine. We build many other types of cages for coal and metal mines; either from our own designs or to meet purchaser's specifications.

Standard 5 hp. Car-Spotting Hoist. Triple-reduction alloy-steel gears and other superior mechanical features assure long service life and low maintenance expense. We build room hoists, scraper hoists and other self-contained electric hoists in a wide variety of types and sizes to meet any probable requirement.

6-Ton Low-Height Diesel-Mechanical Locomotive for underground operation in a foreign country. Special equipment includes back-fire arrester and wet-type exhaust muffler. We also build Electric Mine Locomotives and all types of Diesel, Steam and Fireless Locomotives.

At left: Three-Deck Man Cage for metal mine. Small wheels with pneumatic tires are used, instead of guide shoes, to reduce the vibration and shocks of high-speed hoisting.
At right: Combination Man-Cage and Bottom-Discharge Skip for metal mine. Alloy-steel linings and rubber interlinings assure high resistance to corrosion, abrasion and loading shocks.

Vulcan Iron Works, Wilkes-Barre, Pa.

Heavy-Duty Electric Hoists	Shaking-Chute Conveyors	Steam Locomotives	Load-Carrying Larries
Self-Contained Hoists	Chain Conveyors	Diesel Locomotives	Rotary Kilns, Coolers and Dryers
Scraper Hoists	Cast-Steel Sheaves and Gears	geared and electric drive	Briquetting Machines
Car-Spotting Hoists	Cages, Skips and Gunboats	Gasoline Locomotives	Heavy Special Machinery
Room Hoists	Toothed Double-Roll Crushers	geared and electric drive	Open-Hearth Steel Castings

1951 BCR Research Work To Total Over $1,000,000

The coal industry's plans for its 1951 cooperatively-financed research program to develop improved coal-burning equipment and methods were given final approval Sept. 22 at the annual budget meeting of the board of directors of Bituminous Coal Research, Inc.

Research affecting all coal's major markets will be conducted. The BCR Directors authorized an expenditure of more than $400,000 for carrying out BCR general research projects, exclusive of its programs to develop the coal-burning gas-turbine locomotive and improved mining equipment and methods. BCR's total investment in research is well over $1,000,000 annually. In addition, other industries and associations will add more than $200,000 in support of projects to which some 300 coal and railroad industries are a major contributor through BCR.

Dr. A. A. Potter, BCR's president, stated that this research program is designed to obtain advancements in coal utilization as rapidly as possible, and to inform the public about them. Only through application of its results, he said, can the maximum good of the coal industry's research program be realized.

As a result of the program, a smokeless magazine-feed heating stove, more convenient and efficient than conventional units, is being commercially manufactured. Smokeless magazine-feed warm-air furnaces and heating boilers are undergoing user tests prior to commercialization. A new type of completely automatic stoker with bin feeding and mechanical ash removal is under development.

BCR will continue its research leading to the improvement of the steam locomotive. It will carry on as a major financial and technical contributor to the Allegheny County, Pa., railroads' project to reduce cinder emission, and will continue its studies on steam-locomotive combustion.

In addition to its combustion and equipment research that is helping industry to use coal more efficiently, BCR will start new projects important to industry. It will give major attention next year to evaluating the technical and economic aspects of block heating in business districts, and will appraise the feasibility of increasing the use of electric furnaces in steel making.

BCR last year helped the operators of small industrial plants by showing them how to capitalize on the use of coal by better operating procedures and equipment. Further help will be provided to the small plant owner by a project that will make information about cinder collection available.

Results of BCR research have been an important factor in the abatement of industrial smoke. BCR has been largely responsible for the development and application of modern

You can smooth-out overloads

with the

4-ARM DORR TORQ

You can bypass overload and shutdown problems with 4-arm Dorr Torq Thickeners and Hydroseparators. Here's why:

Raking load is distributed between two sets of arms... one long and one short... both utilizing the automatic, self-lifting Torq principle. The long arms rake the outer section of the tank floor. The short arms take over the load in the inner section, raking the solids to a conventional center-cone discharge. Each set of rakes functions independent of the other.

Mechanically, this provides maximum overload protection for every eventuality. You can start-up a 4-arm Torq under load after a weekend or extended shutdown... in short, can forget overload worries.

The 4-arm Torq is only one of the Dorr units adaptable to modern coal preparation practice. We'd like to give you detailed information on any of those listed at the left.

DORR EQUIPMENT for coal preparation plants

DORR TYPE A THICKENERS & HYDROSEPARATORS
center shaft units . . . up to 50' in diameter . . . for regular duty.

DORR TYPE H HYDROSEPARATORS
center shaft units . . . 40' to 100' in diameter . . . for heavy duty operations.

DORR TORQ THICKENERS & HYDROSEPARATORS
center pier units . . . 60' to 200' in diameter . . . particularly adaptable for water recovery.

DORR TYPE PL THICKENERS & HYDROSEPARATORS
center pier units . . . 100' in diameter and up . . . for special heavy duty operations.

DORRCLONES (DUTCH STATE MINES CYCLONES)
new cylindro-conical units utilizing centrifugal force . . . show promise for certain hydroseparation steps in the coal preparation flowsheet.

DORRCO TYPE W PUMPS
heavy duty, duplex, diaphragm pumps . . . for hydroseparator and thickener underflows . . . two sizes with top capacities of 30 and 75 cubic feet per minute.

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THE DORR COMPANY, ENGINEERS
BARRY PLACE, STAMFORD, CONN.

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RESEARCH ENGINEERING EQUIPMENT

overfire jets which have made it possible for industrial chimneys to be smokeless.

During the current year, BCR completed a survey of the technical and economic factors affecting the manufacture of fuel gas from coal. The results of that survey were published in book form Nov. 1 by McGraw-Hill Book Co., Inc., under the title, "Economics of Fuel Gas From Coal." As a result of the survey, BCR is engaged with others in a project to develop an improved automatic gas producer, capable of high gasification rates. Such gas producers, located at the point of gas consumption would give industrial plants an uninterrupted gas supply under their own control. BCR will continue, also, its work to develop new knowledge in the field of gasification and carbonization. Fundamental research also will continue on the causes and prevention of acid mine water.

While BCR is currently supported by 40% of the commercial coal tonnage mined in the United States, it is the intention of BCR management to promote broader support by the coal industry and railroads, supplemented by interested industrial cosponsors, to provide a coal research program adequate to find the answers to the technical problems of the coal industry and its customers.

Coal Major War Fuel, Bureau Official Says

Warning that another war would create a petroleum shortage and necessitate numerous conversions to coal in both industrial and domestic use, Dr. Arno G. Fieldner, chief, Fuels and Explosives Div., U. S. Bureau of Mines, recently called attention to the need of a "strongly functioning" coal industry capable of taking on a 50% overload in time of emergency.

Dr. Fieldner reviewed "The National Fuels Situation" in an address in Columbus during the Ohio Mineral Industries Conference late in September. His discussion included a resume of Bureau of Mines experimentations in the production of gas and oil from coal and other solids.

Asking for increased support for research and development of synthetic liquid and gaseous fuels from coal "so that no disastrous shortages of these essential forms of energy may occur," Dr. Fieldner pointed to the heavy drain already made on specialty petroleum products—such as aviation gasoline and synthetic rubber—in the present limited emergency. In the event of a major war, he explained, the following factors would merit "primary concern":

"In a full scale emergency, rationing of some petroleum products will undoubtedly be in order, with particular emphasis upon motor fuel and fuel oil uses. In some areas where fuel oil consumption is greatest, augmented supplies of natural gas may

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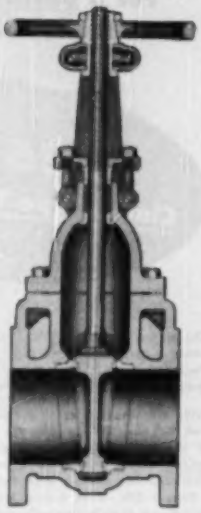
You'll get both from CRANE



Cross-section, No. 465½ Iron Body Flanged Gate, Brass-Trimmed, Sizes 2 to 12 in. Working Pressures: 125-Pounds Steam; up to 200-Pounds Water, Oil, Gas. Available in larger sizes up to 48 in.

BUILT TO STAY IN SERVICE LONGER

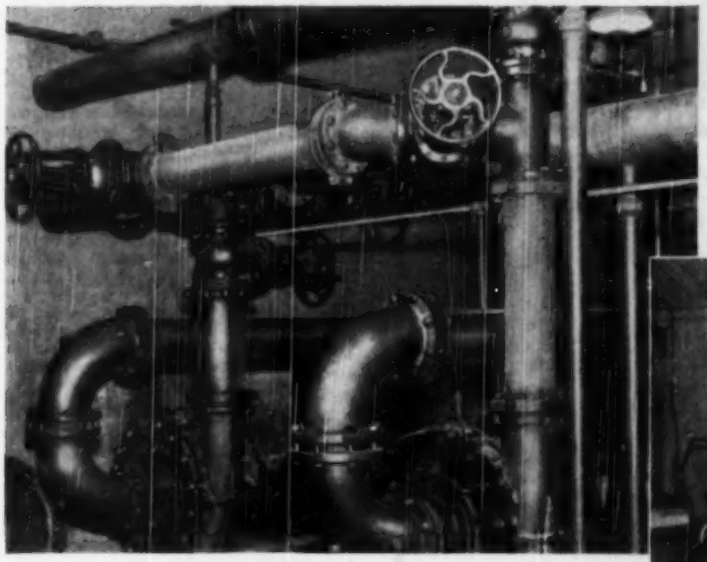
That's what these valves are noted for—long service life with low maintenance cost. Here's why you'll like Crane 125-Pound Iron Body Gates.

Note the stuffing box, for example. Its generous depth assures a tight stem seal and lengthens packing service life. At the bonnet joint, the husky flanges use more bolts to equalize pressure on the gasket. Tie ribs to end flanges give added strength under line strains. In brass-trimmed valves, body seat rings are renewable—don't loosen in service.

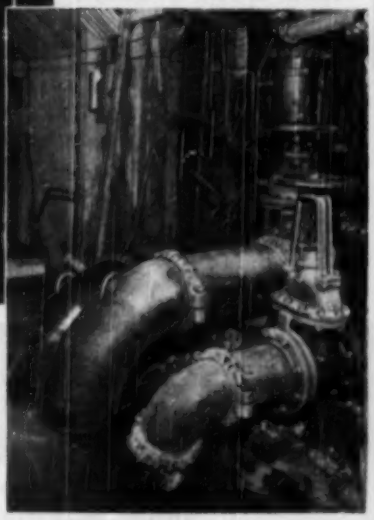
You'll find Crane Iron Body Gates easy to operate. Their fully-guided disc seats smoothly and accurately. Crane disc-stem connection and two-piece ball-type gland prevent side strain on stem—there's no binding of working parts. Made in patterns for every need—brass-trimmed or all-iron, with screwed, flanged or hub ends. See No. 49 Crane Catalog.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

ONE ORDER TO CRANE MAKES AVAILABLE THE WORLD'S MOST COMPLETE SELECTION OF QUALITY PIPING MATERIALS



LINES TO SLUDGE PUMPS *in coal breaker plant, equipped with Crane 125-Pound Iron Body Gate Valves and flanged fittings.*



DRAINAGE WATER STORAGE *in a metal mine. Here Crane Quality piping materials give outstanding service under severe conditions.*

EVERYTHING FOR EVERY PIPING SYSTEM

CRANE

VALVES • FITTINGS • PIPE • PLUMBING AND HEATING

ease the stress on oil supplies. It seems probable that a rise in costs of heavy fuel oils may stimulate greater use of coal by those utility and industrial plants that are equipped to utilize both coal and oil, and may cause some conversion of other large-scale facilities from oil to coal in the early stages of an emergency.

"The extent to which conversions may take place will depend primarily upon the intensity and duration of the period of stress. A long-time conflict that would seriously cut down oil imports from South America would necessitate construction of synthetic plants for making oil from natural gas, shale, and coal. Coal-hydrogenation plants could also produce benzol, toluol, xylol, and phenols now in short supply and urgently needed for synthetic rubber, plastics, and explosives."

The Bureau executive said that coal will ultimately be the primary source of liquid and gaseous fuels as well as solid fuels, and he concluded his remarks with the statement that research should be "vigorously continued on better mechanical methods for mining coal and on its direct utilization in solid or fluidized form with greater convenience and efficiency."

BCR Committee to Broaden Research Opportunities

A new advisory committee that will anticipate the technical needs and opportunities of BCR member companies and their customers and help guide the coal industry's research program accordingly has been organized by Bituminous Coal Research, Inc.

Composed of men in constant touch with a wide range of research on fuels and their utilization, the group will be concerned with research projects anywhere that might affect future markets for coal or dictate a change in BCR research activities or objectives.

It will advise BCR management on any opportunity for industry progress through coal research and will keep BCR informed about developments outside BCR's scope of activities that can be used to the advantage of BCR member companies.

In carrying out their advisory function, the members of the committee will assist BCR in maintaining a proper balance between research for long-range objectives and projects whose aim is to help consumers to use coal more effectively or to meet current competition from other fuels.

Members of the committee are: George D. Creelman, director of research, The M. A. Hanna Co., chairman; Dr. H. J. Rose, vice president and director of research, BCR; John I. Yellott, director of research, BCR Locomotive Development Committee; Gerald von Stroh, director of development, BCR Mining Development Committee; Dr. H. H. Lowry, director, Coal Research Laboratory, Carnegie

Institute of Technology; Dr. H. H. Storch, chief, Synthetic Fuels Div., USBM; and Dr. H. S. Turner, Director of the research and development div., Pittsburgh Consolidation Coal Co. Ex officio members are: Dr. A. A. Potter, BCR president; C. A. Reed, secretary of BCR, and E. R. Kaiser, BCR assistant director of research.

Lehigh Navigation Cited For Annual Report

In the final ratings of the independent board of judges for the *Financial World* Survey of Annual Reports, Lehigh Coal & Navigation Co. was judged as having the best annual report of the coal and coke industry. The bronze "Oscar of Industry" trophy was to be presented to Robert V. White, company president, at the annual Awards Banquet in the Grand Ballroom of the Hotel Statler, New York, Oct. 30.

More than 5,000 annual reports were submitted this year in the international competition, the tenth in the series of surveys, and these were judged in one hundred industrial classifications for the "Best-of-the-Industry" awards. In the coal and coke industry category, United Electric Coal Cos. was runner-up for top honors, while the Philadelphia & Reading Coal & Iron Co. placed third.

Electro-Mechanical Group Reports on Activities

Membership of the Mining Electro-Mechanical Maintenance Association has practically doubled in the past year, Donald J. Baker, secretary-treasurer of the Central Advisory Council, announced last month in making the second annual report.

Some 41 programs are scheduled for the coming season, which is about double the number a year ago, Mr. Baker said. Since the last report, three additional branches have been established, bringing the total to six. The new branches are located at Barnesboro, Fairmont and Morgantown. New branches at Brownsville, Pa., and St. Clairsville, Ohio, are anticipated before the end of the year.

Organizations supporting the association as Patron Members now include: Allegheny-Pittsburgh Coal Co.; Berwind-White Coal Co.; The Buckeye Coal Co.; *Coal Age; Coal Mining;* Crucible Steel Co. of America; Duquesne Light Co.; Ebensburg Coal Co.; General Electric Co.; Goodman Mfg. Co.; Hillman Coal & Coke Co.; Hulburt Oil & Grease Co.; Industrial Electric Co.; I-T-E Circuit Breaker Co.; Jeffrey Mfg. Co.; Johnstown Coal & Coke Co.; Joy Mfg. Co.; Mather Collieries Co.; *Mechanization;* Mine Safety Appliances Co.; Penn Machine Co.; Schroeder Bros.; E. S. Stickle Co.; Westinghouse Electric Corp.; and Whitney Chain & Mfg. Co.

(*Continued on page* 186)

CINCINNATI CHAINS, BITS AND BARS

HUNDREDS of Mine Operators, their superintendents, and engineers have found that Cincinnati Chains, Bits and Bars OUTLAST AND OUTCUT all others. Cincinnati Chains . . . both the DUPLEX and the STANDARD are made of high grade alloy steel . . . heat treated and drop forged and engineered to place the greatest wear and tear on easily replaceable long life parts. The Duplex double-ended reversible bit also reduces costs and saves time. It not only eliminates bit sharpening operations but reduces bit hauling time of mine sharpened bits by approximately 90%. Bit Setting Time is greatly reduced. Each point of the Duplex Bit outcuts from 2 to 6 ordinary Mine Sharpened Bits. Take a step in the right direction . . . equip your cutting machines with "CINCINNATI MINE" products.

CINCINNATI STANDARD CHAIN

Cincinnati Standard Chain accommodates Stanex Holder and Bit or regular ½" x 1" bit. Similar in design to the famous Duplex Chain.

STANEX HOLDER AND BIT

The Stanex Holder and factory made double-ended Stanex Bit fits all chains that accommodate the regular ½" x 1" bit.

THE CINCINNATI MINE MACHINERY CO.

2983 SPRING GROVE AVENUE • CINCINNATI, OHIO

COAL MEN ON THE JOB

DELTA MINE, Ayrshire Collieries Co., Marion, Ill.: Gus Syers (left), machinist; and E. Smith, shop foreman.

Officers of the association elected at the first annual election last May are: D. C. Jones, president; G. P. Airhart, vice president; and Mr. Baker. Additional information regarding the group's activities may be secured from Mr. Baker, 634 Washington Rd., Pittsburgh 28, Pa.

CHS Broadens Services To Retail Coal Dealers

Plans for broadening the services of the Coal Heating Service Division, NCA, to all retail coal merchants, regardless of their present affiliation with CHS, were completed at a meeting of the NCA marketing committee in Cincinnati, Sept. 25.

As an example of added services, H. A. Glover, Chairman, NCA marketing committee, stated that a newspaper mat service is to be set up for use by all retailers. Also, use of the recently announced Step-Up Sales Training Program is open to non-CHS retailers on exactly the same terms as it is offered to CHS retailers, Mr. Glover announced. He also stated that additional training programs are planned.

In the meantime, the CHS field staff is being enlarged to make it possible to work more closely with retail coal associations and with retailers desiring such cooperation.

Anthracite Advertising Stresses Health Theme

The Anthracite Institute's fall advertising campaign in newspapers will continue to punch the health theme hard, while also featuring the over-all advantages of anthracite and automatic equipment, according to Edward H. Walker, institute vice president in charge of public relations.

The advertisements, scheduled for Sept. 26, Oct. 10 and 24, Nov. 7 and

Photo courtesy The Jeffrey Manufacturing Company

Save On Your Operating Costs!

WITH ALEMITE MECHANIZED LUBRICATION

One of the best, proven ways to cut your operating costs is to protect expensive mining machinery against coal dust and dirt. In shaft or strip mining, Alemite Lubrication methods cut repair costs, keep lubricants free from contamination and save costly man-hours by faster, easier *mechanized* lubrication.

Vital moving parts of every mining machine get the positive, regular lubrication they need for dependable, trouble-free operation. From-barrel-to-bearing, Alemite equipment and methods assure safe, fast handling and application of grease and oil—without waste or mess. Refinery-sealed lubricants are kept *clean*, unexposed to dirt and dust and untouched by human hands!

Alemite pumps can be powered with air or electricity, above or below ground. Alemite mechanized equipment provides rapid, dependable lubrication for your mine cars and machinery at minimum cost.

WRITE NOW for complete details on how to cut your operating costs with Alemite lubrication methods from-barrel-to-bearing. Alemite, Dept. E-118, 1850 Diversey Parkway, Chicago 14, Illinois.

ALEMITE

Lubrication Methods that Cut Production Costs

Alemite Cuts Costs 3 Ways...

1. Transferring Lubricants without mess or contamination! Cuts man-hours 63% per 100 lbs. of lubricant transferred.

2. Loading Grease Guns rapidly, completely! Saves 3¾ man-hours per 100 lbs. of grease loaded into hand guns.

3. Applying Lubricants quickly, safely. Cuts 23.9 man-hours per 100 lbs. of lubricant applied to bearings.

21, will appear in the regular list of over 80 cities. The market area advertisements will be either 840 or 640 lines in size.

"All newspapers," Mr. Walker said, "have been furnished with advertising mats to help dealers tie in to the overall campaign with their own local advertising. Material for consumer merchandising, in the form of booklets, mailing folders and other sales aids is available to dealers by writing to the Anthracite Institute, 101 Park Ave., New York, or asking the institute's field representative in the particular market area.

"I strongly urge all dealers to make the most of this year's increased sales opportunities by adding their own effort in every way they can to the record promotional campaign of Anthracite Institute and the individual producing companies," Mr. Walker said. "This is also the time to push equipment and sales and installations and to back fill-ups by pointing out to all customers the importance of filling their bins right now," he emphasized.

Coal Publications

Gas Producers and Blast Furnaces: Theory and Methods of Calculation, by Wilhelm Gumz. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1950. 316 pp. 5¾x8¾-in; cloth. $7. How to solve gas-producer and blast-furnace problems by mathematical calculation rather than by unnecessary and costly experimentation. Explanatory text, sample problems, formulas, tables and graphs.

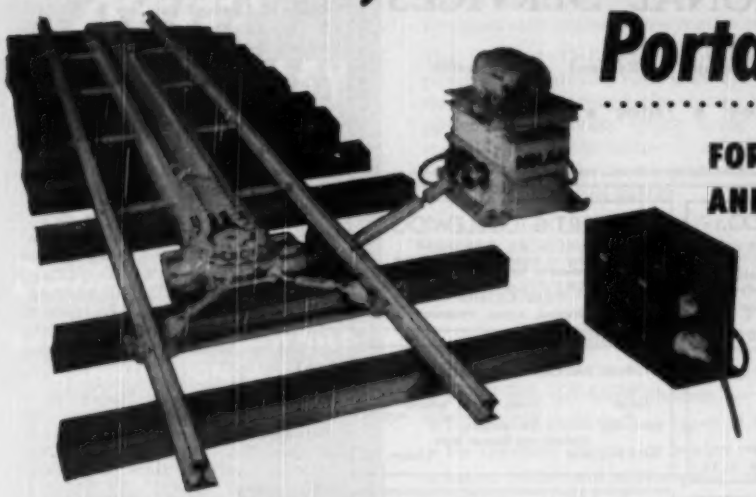
Pennsylvania Spores of Illinois and Their Use in Correlation, by R. M. Kosanke. State Geological Survey, Urbana, Ill., Bulletin 74. 128 pp. $1. Descriptions of new genera and species, and correlations of Illinois coal beds.

The following publications by the U. S. Bureau of Mines may be obtained free upon request to the Publications Distribution Section, 4800 *Forbes St., Pittsburgh* 13, *Pa. All are* 8x10½*-in; paper; mimeo.*

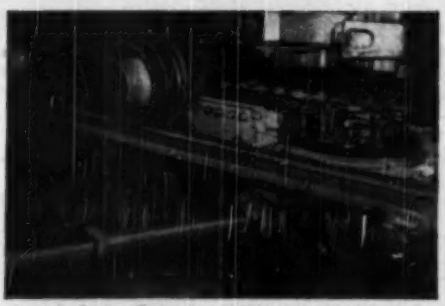
The Possible Effect of the Expanding Use of Natural Gas on the Production of Coke and Coal Chemicals in the United States, by J. A. DeCarlo and J. A. Corgan. I.C. 7579. 16 pp. Summary of replies to an inquiry addressed by the Bureau to coke-plant operators. About 10% of the annual coke output of utilities and merchant operators, and 2% of the total coke capacity of the nation, is expected to be lost to natural gas within the next 5 yr.

Investigation of the Propagation of Blast Waves Over Relatively Large Distances and the Damaging Possibilities of Such Propagation. Ballistics Research Laboratory, Report 675. With "rules of thumb" plus tempera-

Announcing the new NOLAN *Porta-Feeder*



FOR QUICKLY AND ECONOMICALLY SPOTTING CARS FOR LOADING . . .



Porta-Feeder Installation in a PITTSBURGH COAL CO. Mine

Close-up view of the heavy propeller shaft and universal joint assembly used to drive the new Nolan Porta-Feeder. Note the strong, massive construction of the feeding mechanism, and its position on top of the track ties.

The compact design and construction of the entire Nolan Porta-Feeder installation in the Pittsburgh Coal Company mine is shown in this photograph.

Investigate the Nolan Porta-Feeder for ease of installation, economy of operation, ruggedness and safety in your mine car-spotting equipment!

The Porta-Feeder mounts between the rails on top of the track ties, secured by jacks that permit quick movability. Little or no excavation or preliminary foundation work is necessary. The drive is on skids and is connected to the gear head by a strong universal joint and propeller shaft assembly. A sealed drive head allows operation in water up to the base of the rails. Reciprocating pushing dogs deliver constant forward feeding motion.

Because of its comparatively light weight, and freedom from need of expensive, permanent-type anchorage, the Nolan Porta-Feeder can be quickly moved as necessary, without excessive loss of time or production. No ropes or cables are used in the Porta-Feeder. High efficiency is attained through the short-shaft delivery of power and uninterrupted forward flow of action. Extreme ruggedness of construction assures long service life.

Actual mine service has proved the high efficiency of the Nolan Porta-Feeder—write for full details.

NOLAN

THE NOLAN COMPANY BOWERSTON, OHIO

PROFESSIONAL SERVICES

Consulting • Plant Design • Research • Inspection

Land Examinations • Testing • Appraisals

ALLEN & GARCIA CO.
ENGINEERS AND BUILDERS OF MODERN COAL OPERATION
Authoritative Valuations and Reports of Mining Properties Equipment and Operation.
333 N. Michigan Ave., Chicago
120 Wall Street, New York, N. Y.

HERBERT S. LITTLEWOOD
CONSULTING ENGINEER
Application — Supervision of Installation
Maintenance - Inspection - Testing
POWER-HAULAGE HOISTING VENTILATION
1104 South Braddock Avenue, Pittsburgh 18, Pa.

GEO. S. BATON & COMPANY
Consulting Engineers
Cost Analysis — Valuations
Mine and Preparation Plant Designs
1100 Union Trust Building — Pittsburgh 19, Pa.

P. R. PAULICK and ASSOCIATES
CONSULTING MINING ENGINEERS
Design & Application ..... Modern Mining Methods
..... Mine Mechanization Systems
..... Cost Analysis
Domestic and Foreign Work
South Park Road — Library, Pa.

F. CARL COLCORD
CONSULTING ENGINEER
COAL LAND VALUATIONS
MINE INSTALLATIONS
OPERATION
Box 388, Paris, Ky. — Phone 327W

PIERCE MANAGEMENT, INC.
MINING ENGINEERS
A Background of 32 Years of Design, Consulting and Management Service to Coal and Mineral Industries in 39 States and 16 Foreign Countries.
Scranton Electric Bldg. — Scranton 3, Pa.
1025 Connecticut Ave., N.W. — Washington 6, D.C.

EAVENSON & AUCHMUTY
Mining Engineers
COAL OPERATION CONSULTANTS
VALUATION
2720 Koppers Bldg. — Pittsburgh 19, Pa.

K. PRINS & ASSOCIATES
Engineers and Consultants
Designers of low cost coal preparation plants, Tipples and structures.
THE PRINS COAL WASHER
Wellston — Ohio

HENRY O. ERB
COAL PREPARATION CONSULTANT
PLANT DESIGN AND OPERATION
Midwestern Representative
"VIKING" HOT VAPOR OIL TREATING PROCESS
619 So. 6th St. — Terre Haute, Ind.

DAVIS READ
Mining Consultant
Mining Production Methods
Plant Design — Preparation
235 East Noel Ave. — Madisonville, Kentucky

FERGUSON-GATES ENGINEERING CO.
Registered Civil and Mining Engineers
Reports on Developed and Undeveloped Coal Properties
Valuations and Appraisals
Studies of Airborne Dust and Dust Control in the Mines
Consultation Service
Allen Building — P. O. Box 673
Telephone 5721 — Buckley, W. Va.

TEMPLETON-MATTHEWS CORPORATION
Designing Engineers—Consultants—Builders
MODERN COAL PREPARATION PLANTS THRU "CO-OPERATIVE ENGINEERING"
900-08 Sycamore Bldg. — Terre Haute, Indiana

J. H. FLETCHER
35 Years
Continuous Consulting Service
to Coal Mines
Telephone HArrison 7-3151
332 S. Michigan Ave. — Chicago 4, Illinois

J. W. WOOMER & ASSOCIATES
Consulting Mining Engineers
Modern Mining Systems and Designs
Foreign and Domestic Mining Reports
National Bank Building — Wheeling, W. Va.
Union Trust Building — Pittsburgh, Penna.

D. P. GRAHAM
Designer and Consultant
TRACK and TRACKLESS HAULAGE
661 Chelsea Ave. — Columbus 9, Ohio
Tel.: DOuglas 3334

Consult these SPECIALISTS
Let them save your time by bringing their broad experience in their specialty to bear on your problems.

ture and wind soundings, the presence of dangerous or disturbing propagating conditions can be determined.

Data on Pumping at the Anthracite Mines of Pennsylvania, by S. H. Ash, W. L. Eaton, J. C. Gilbert, H. M. James, H. E. Jenkins, D. O. Kennedy, H. D. Kyner, H. B. Link and W. M. Romischer. R.I. 4700. 264 pp. The volume of water pumped in 1945 from anthracite mines is equal to the mean average flow of the Lackawanna River at Old Forge, plus that of the Schuylkill at Pottsville, plus that of the Little Schuylkill at Tamaqua. Tables and charts.

Recent Developments in Combination Cleaning and Dewatering of Fine Sizes of Coal, by B. W. Gandrud and H. L. Riley. R.I. 4707. Kerosene flotation of raw fines and sludge reduces the need for settling tanks and recovers coking-grade fines that otherwise might be lost.

Burning Anthracite Barley on a Chair-Grate Stoker in a Two-Arch Furnace, by L. R. Burdick and R. E. Morgan. R.I. 4720. Tables and curves showing results of tests on a chain-grate stoker.

Roof Bolting in the United States, by Edward Thomas. I.C. 7583. 8 pp. History, methods of installation, safety aspects and research completed and underway. A paper read in Paris, France, July, 1950.

MAINTAINS CLOSE CONTACT...

...With Buying Information

"We use this Catalog throughout the year," says Mr. W. E. Sellards, President of Left Fork Fuel Co., Inc., Lewisburg, West Virginia.

The catalog is, of course, McGRAW-HILL'S PRE-FILED MINING CATALOGS. This is a comprehensive collection of manufacturers' catalogs which are *pre-filed* in a handy volume for greater convenience and accessibility. Consulting this Pre-Filed Buying Information helps Mr. Sellards maintain close contact with manufacturers of equipment and supplies which he needs in his business.

If PRE-FILED MINING CATALOGS is not available for buying reference at your mine, write to McGRAW-HILL CATALOG SERVICE, 330 West 42nd Street, New York 18, N. Y. There is no charge to qualified users.

NEW!
BAKER TROLLEY TRACTOR
For Trolley or Battery Operation

BATTERY CHARGED WHILE RUNNING ON WIRE

Here is the ideal supplementary transportation system for mines utilizing belt conveyors for main line haulage.

The BAKER TROLLEY TRACTOR, an electric-powered, rubber-tired unit, is always ready for service above or below ground—the storage batteries used for power beyond trolley system being re-charged automatically while the tractor is either running or idle on the trolley. The motor-generator charger cuts off automatically at full charge.

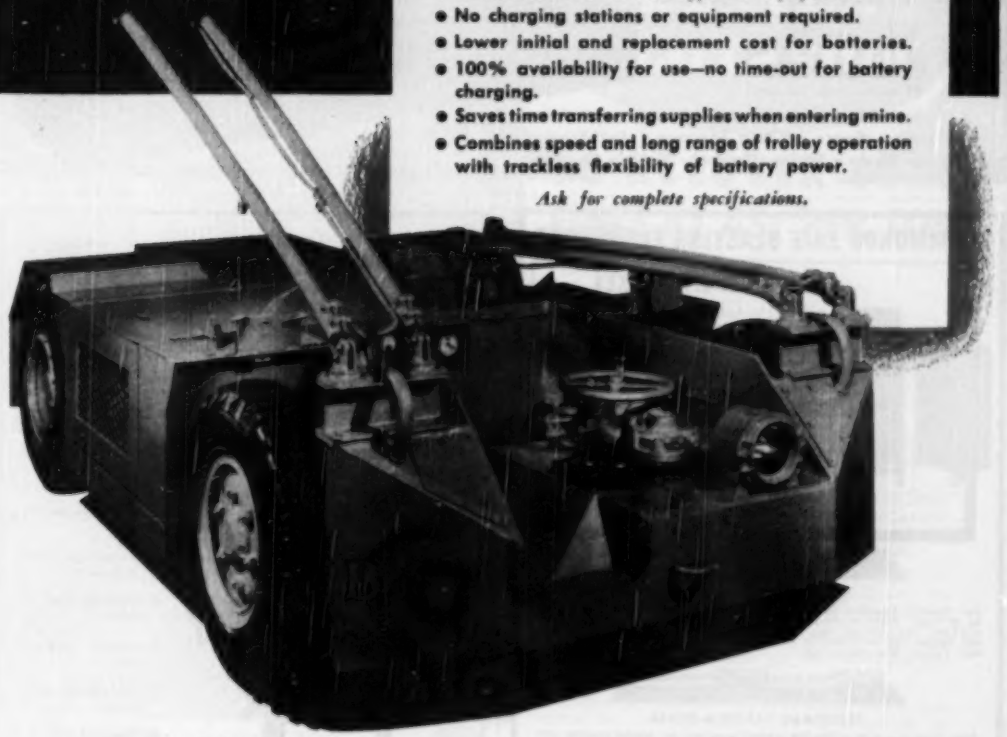
With the BAKER TROLLEY TRACTOR, personnel, supplies, tools, etc., can be transported in trailers for any distance while operating on the trolley and continue without delay where batteries take over.

Specific advantages are:

Safe for hazardous areas when running on battery power.

- **Speed and unlimited distance for long hauls.**
- **Eliminates need for two types of equipment.**
- **No charging stations or equipment required.**
- **Lower initial and replacement cost for batteries.**
- **100% availability for use—no time-out for battery charging.**
- **Saves time transferring supplies when entering mine.**
- **Combines speed and long range of trolley operation with trackless flexibility of battery power.**

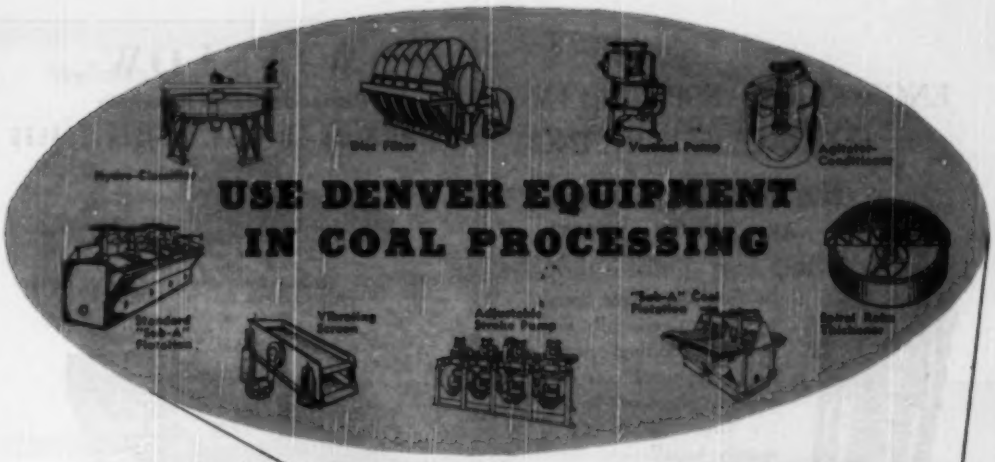
Ask for complete specifications.



Manufactured by
THE BAKER-RAULANG CO.
1213 West 80th Street • • • Cleveland, Ohio

Exclusive Coal Mine Representative
J. H. FLETCHER & CO.
Chicago, Illinois • • Huntington, W. Virginia

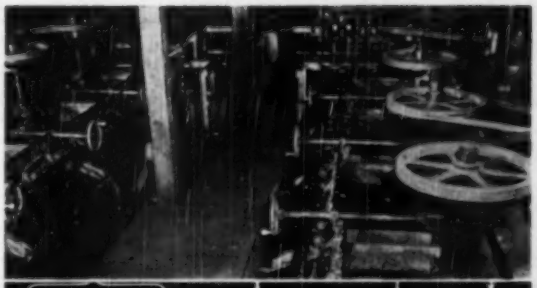
Baker MINE EQUIPMENT

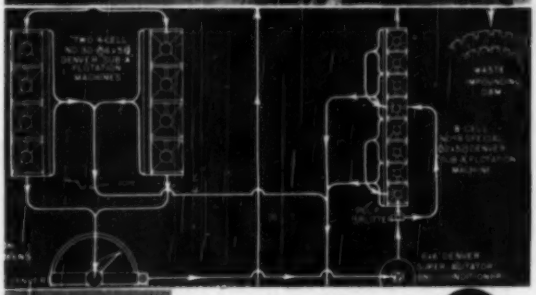


LEHIGH NAVIGATION & COAL CO. USES

DENVER FLOTATION

TO RECOVER COAL FINES AT 45c PER TON





Product: Anthracite coal fines.

Tonnage: 60-90 tons per hour.

Flotation Cells: Two 4-cell No. 30 (56x56) Denver "Sub-A." One 8-cell No. 18 Sp. (32x32) Denver "Sub-A."

Other Deco Equipment: Pumps, Hydro-Classifiers, Thickeners, Samplers, Agitators.

Lehigh Navigation Coal Company has been using Denver "Sub-A's" to recover anthracite fines from breaker waste water since 1942.

Denver "Sub-A's" are used exclusively at their Tamaqua operation because of their flexibility, low maintenance, low operating cost, ability to handle course solids and make high recoveries of low ash concentrates.

Feed:	—20 mesh; 20-25% solids; 25-30% ash
Concentrate:	40% solids; 11-12% ash
Refuse:	65-70% ash
Reagent Cost:	$0.06 per ton of recovered coal fines
Total Operating Costs:	$0.45 per ton of recovered coal fines.

Following competitive tests at Tamaqua, Lehigh Navigation and Coal Company ordered two 6-cell No. 30 Denver "Sub-A" machines for their Coaldale Plant.

For full details on this interesting operation write for Engineering Notebook Bulletin M4-B50.

FLOTATION ENGINEERS

DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

"The firm that makes its friends happier, healthier and wealthier"

DENVER • NEW YORK • CHICAGO • EL PASO • VANCOUVER • TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG • RICHMOND

DENVER EQUIPMENT CO., 1403 Seventeenth St., Denver 17, Colorado

Wellman will build it

- Special Cranes
- Tower Unloading Cranes
- Ore Unloaders
- Gas Producer Plants
- Charging Machines
- Industrial Furnaces
- Car Dumpers
- Gas Flue Systems
- Gas Reversing Valves
- Coke Pushers
- Mine Hoists
- Skip Hoists
- Ore and Coal Bridges
- Clamshell Buckets

→ speed coal handling with

Wellman Tower Unloading Cranes

Wellman Tower Unloading Crane with 6¼ ton "Williams" type Multiple Rope Bucket.

• The Wellman crane shown above provides highly efficient unloading of barges. It is just one of many pieces of modern, dependable equipment designed and built by Wellman to improve your coal handling. Take advantage of Wellman's half century of experience to help speed your operations and cut your costs.

THE WELLMAN ENGINEERING COMPANY
7007 CENTRAL AVENUE • CLEVELAND 4, OHIO

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
Not available for equipment advertising
10c a line. Minimum 4 lines. To figure advance payment count 5 average words as a line. (See ¶ on Box Numbers.)
INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, 40 cents a line an insertion.

INFORMATION:
BOX NUMBERS count one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals.)

DISPLAYED RATE
The advertising rate is $7.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

NEW ADVERTISEMENTS received by 10 A.M. November 15th at the New York Office, 330 W. 42nd St., N. Y. 18, N. Y., will appear in the December issue subject to limitations of space available.

MOTOR GENERATORS

1—600 KW G. E. Syn 275 V. 900 RPM 3 Ph., 60 Cy., 440/2300/4000 V. AC.
2—300 KW G.E. Syn. 275 V. 1200 RPM 3 Ph., 60 Cy., 440/2300/4000 V. AC.
1—300 KW G.E. Syn. 575 V. 1200 RPM 3 Ph., 60 Cy., 2300/4000 V. AC.,
1—240 KW G.E. Syn. 275 V. 1200 RPM 3 Ph., 60 Cy., 2300/4000 V. AC.
1—200 KW G.E. Syn. 275 V. 1200 RPM 3 Ph., 60 Cy., 2300/4000 V. AC.
1—180 KW G.E. Ind. 275 V. 1200 RPM 3 Ph., 60 Cy., 440/2300/4000 V. AC.

ROTARY CONVERTER

1—150 KW G.E. Syn. 275 V. 1200 RPM HCC. 6 Ph., 60 Cy. Transformers

ARMATURES

1—800 KW G.E. 275 V. MFC Generator 900 RPM
1—300 KW G.E. 575 V. HCC Converter 1200 RPM

LOCOMOTIVES

2—30 T JEFFREY 250 V. MH-77 48-36" Ga.
3—20 T JEFFREY 250 V. MH-77 48-36" Ga.
3—15 T JEFFREY 250 V. MH-77 48-36" Ga.
2—13 T JEFFREY 250 V. MH-2110 42-32" Ga
1—13 T GOODMAN 250 V. 134-B 48-36" Ga.
1—10 T JEFFREY 250 V. MH-110 44-32" Ga.
1—10 T G. E. 250 V. HM-829-A 48-36" Ga.
3—10 T GOODMAN 250 V. 34-B 48-36" Ga.
1—8 T WEST. 250 V. ML-906-C 44-36" Ga.

LOCOMOTIVE MOTORS

2—JEFFREY 250 V. HM-77, Ball Bearing
2—WEST. 250 V. ML-908-C, Ball Bearing
1—WEST. 250 V. ML-907-C, Ball Bearing
2—WEST. 250 V. ML-906-C, Ball Bearing
2—WEST. 250 V. ML-904-B, B. B. (New)
1—WEST. 250 C. ML-901-C, Ball Bearing
2—G.E. 85/125 V. HM-829-A, Ball Bearing

LOCOMOTIVE ARMATURES

MH-79-500 V. MH-77-250 V. 908-C-500 V.
903-C-250 V. 906-C-250 V. 901-C-250 V.
158-C-250 V. HM-829-A-85/125 V.

WALLACE E. KIRK COMPANY

501 GRANT BUILDING **PITTSBURGH 19, PENNSYLVANIA**

FOR SALE

We have the following equipment for sale at our Hocking mine, which is about four miles north of Athens, Ohio:

Joy 14 BU loader.
G.E. 6 ton Gatheny Loco—42" gauge
G.E. 10 ton locomotive—42" G.
Jeffrey MH-100 locomotive—8 ton.
Jeffrey MH-88 cable reel locomotive.
G.E. 150 KW converters, complete with switchboards and transformers.
G.E. 100 KW converter, complete with switchboards and transformers.
Mine Hoists.
Goodman shortwall.
Rubins vibrators.
Jeffrey 6A drills.
Bank cars, Joy parts, loading booms, belt conveyors, feeders and other items too numerous to mention.

COTTINGHAM, INC.
Nelsonville, Ohio
Phone Nelsonville 230
Athens 852 or 24005

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION VACANT

LARGE MINING Company in South America requires services of experienced man as Assistant Superintendent (Mine Foreman) of coal mine. Should be able to take complete charge during absence of Superintendent. Good opportunity for right man. Spanish an asset. Liberal three-year contract, transportation, married quarters. P 7913, Coal Age.

POSITION WANTED

MASTER MECHANIC, Chief Electrician or Shop Foreman, over 20 years experience, technical education, or what can you offer in the way of a position to start with your company. PW 7840, Coal Age.

WANTED

ANYTHING within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

Engineers - Executives - Technical Men

Salaried Positions, $4,000 to $30,000. This Confidential service for men who desire a new connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details.

TOMSETT ASSOCIATES
1206-2 Burger Bldg. Pittsburg 19, Pa.

FOR SALE

Fully equipped operating mine including tipple, washer, mine buildings and mine. On the famous Black Creek Seam in Alabama. Will entertain offers on either going concern basis or on equipment. Also, fully equipped mine on the Mary Lee Seam in Alabama on either going concern basis or equipment.

NOTKIN COAL AGE
520 N. Michigan Ave. Chicago 11, Ill.

FOR SALE

COAL INTEREST IN NEW MEXICO

Long term lease on New Mexico Coal holdings, proven but not fully developed—2 separate levels good bituminous coal. Lease to be sold to liquidate estate of deceased partner. For full details, write

VALENCIA COAL COMPANY
W. T. Morrow, President
Box 287, Albuquerque, New Mexico

WANTED

Strip Coal Property with or near Loading Facilities. Stripping equipment now available to produce 1500 Tons per day.

Prefer West Virginia Properties.

Contact, Tuckahoe Mining Company, Inc., Box 266, Tuckahoe, New York.

FOR SALE

MINE TELEPHONES

W.E. #1326E — Cast Iron Housing Rebuilt, Appearance and Operation Equivalent to New, $75.00 each.

Immediate Shipment

TEL-EQUIPMENT CO.
1000 Bower Hill Road, Pittsburgh 15, Penna.

WANTED

One or more 35 to 45 ton Diesel-mechanical or Diesel-electrical locomotives, Davenport or similar, 0-6-0 type, preferably narrow gauge for conversion to our 27½" track. When quoting please state make, age, serial number, make and horsepower of motor, location and enclose blue prints. Aircraft offers to P. O Box 1348, Havana, Cuba.

LEGAL NOTICE

STATEMENT OF THE OWNERSHIP, MANAGEMENT, AND CIRCULATION REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946
(Title 39, United States Code, Section 233)

Of Coal Age, published monthly at Chicago, Illinois, for October 1, 1950.

1. The name and address of the publisher, editor and sales manager is: Publisher, McGraw-Hill Publishing Company, Inc., 330 West 42nd St., New York, N. Y.; Editor, Ivan Given, 330 West 42nd St., New York, N. Y.; Managing Editor, None; Sales Manager, R. W. Davis, 330 West 42nd St., New York, N. Y.

2. The owner is: McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York 18, N. Y.; Stockholders holding 1% or more of stock: Curtis W. McGraw, Executor of the Will of James H. McGraw, 330 West 42nd Street, New York 18, N. Y.; James H. McGraw, Jr., Curtis W. McGraw and Donald C. McGraw, Trustees for: Harold W. McGraw, James H. McGraw, Jr., Donald C. McGraw, Curtis W. McGraw, all of 330 West 42nd Street, New York 18, N. Y.; James H. McGraw, Jr. and Curtis W. McGraw, Trustees for Catherine Oumun, 330 West 42nd Street, New York 18, N. Y.; Edwin S. Wilsey and Curtis W. McGraw, Trustees for James H. McGraw, 3rd, Madison, New Jersey; James H. McGraw, Jr., 330 West 42nd Street, New York 18, N. Y., Curtis W. McGraw, 330 West 42nd Street, New York 18, N. Y.; Donald C. McGraw, 330 West 42nd Street, New York 18, N. Y.; Mildred W. McGraw, Madison, New Jersey; Grace W. McGraw, 550 Arenas St., LaJolla, Calif.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

McGRAW-HILL PUBLISHING COMPANY, Inc.
By J. A. Gerardi, Vice Pres. & Treas.

Sworn to and subscribed before me this 15th day of September, 1950.
[SEAL] ELVA G. MASLIN.
(My commission expires March 30, 1953.)

FOR SALE

CRUSHERS

1—24x24 McNally Pittsburgh single roll crusher.
1—24x48 McNally Pittsburgh double roll crusher.
1—30x60 Link Belt double roller crusher.
1—18x18 Jeffrey single roll crusher.
1—30x36 United Iron Works single roll crusher.
1—24x24 Jeffrey single roll crusher.
1—24x24 Hercules single roll crusher.

HOISTS

1—Ottumwa Iron Works conical drum hoist, serial #3148, weight 35,000#, 1⅛" rope, complete with remote control and hydraulic brake. Direct connected to GE 300 HP motor, model #C2847, type ITC-5017, form M 3/60/2200V, 570 RPM, 73½ amps, 370 secondary amps, complete with automatic switchboard.

1—Ottumwa Iron Works, single rigid cylindro-conical drum hoist, serial #4088, weight 42,000 lbs. 1⅛" rope, complete with remote control and hydraulic brakes direct connected to Western Electric 150 HP. motor, model 17815, type MT-384-10-150-720, form B, 3 phase, 60 cycle, 440 volts, slip ring, secondary volts 388, amps. 187, secondary amps. 182, speed full load 708, serial #4563312, continuous 40° C. Complete with controller and resistance.

1—Ottumwa Hoist #3541, drum diameter 48", face 38", face grooved for 1" rope, equipped with post brake 54" diameter, hand operated, single reduction cut spur gears, 19 teeth and 138 teeth, 1¾" pitch, 10" face, drum shaft 7" diameter, drum shaft bearing 7"x16", pinion shaft bearing 4½"x15" of the ring oiling type.

LOCOMOTIVES

1—15 ton Goodman ball bearing locomotive, 42" gauge, type 36-A-O-4-C.

3—8 ton Goodman ball-bearing locomotives, 36" gauge, type 3204T.

1—8 ton Goodman ball bearing locomotive, 42" gauge, type 32-AO-6T.

1—8 ton Westinghouse locomotive, 36" gauge, Class 4-2-38-C-437.

1—6 ton Jeffrey locomotive, 42" gauge.

6—4 ton GE ball bearing locomotives, 42" gauge, class HM1T6MM11 with HM871-A motors.

1—4 ton Whitcomb Battery locomotive, 36" gauge.

2—4 ton Goodman ball bearing locomotives, 36" gauge, type 42-1-4-T. (with or without gathering reels).

1—20 ton Goodman ball bearing locomotive, 42" gauge, type 36AO4T.

MINING MACHINES

1—112AA Goodman DC Universal mining machine, 36" gauge, 6½ ft. cutter bar.

2—CLES, AC, 3 phase, 60 cycle, 220 volt, Sullivan longwall mining machines.

1—Jeffrey Shortwall Mining Machine, 35 BB, AC, 8' cutter bar complete with tip turn truck, cable and reel.

1—Sullivan Shearing Machine, Class CH11, DC, 9' cutter bar.

2—Sullivan Longwall Mining Machines, type CH8, 3/60/220 volts, 30" cutter bars.

1—12AA Goodman mining machine, 50 HP, 42" gauge.

2—Goodman Standard mining machines, 50 HP, 3/60/220 volts, 42" gauge.

MOTOR GENERATOR SETS

1—300 KW GE motor generator set #975449, type MPC-6-300-1200, form L, amps 725, speed 1200, volts no load 250, volts full load 275, 300 KW nominal—300 KW 2 hrs., 55° C rise direct connected to 300 HP GE syn. motor #1333989, type ATI-6-300-1200, form C, 60 cycles, 73 amps, speed 1200 RPM, volts 2300, PF 8, HP output 300. Complete with switchboard.

1—200 KW Synchronous Ridgway Motor Generator Set, 1200 rpm, 250 volts, DC, 2300 volts, AC, complete with switchboard.

1—90 KW GE motor generator set type CD 133, form A, comp. wound, 327 amps, 250 volts no load, 275 volts full load, 1200 RPM, cont. 50 deg. cent., #1530000 direct connected to 135 HP GE syn. motor type TS, form PK, frame 7588, 3/60/2300 volts, 1200 RPM, 27.8 amps, cont. 40 deg. cent. Excitation 250 volts, 4.8 amps. .74 PF, #4814071, complete with switchboard.

VIBRATORS

1—Allis Chalmers Aero-Vibe single deck vibrator, size 1½' x 6'.
1—Stephens Adamson two deck vibrator size 4' x 10'.
1—Doubledeck vibrator size 3' x 4½'.

RAILS

Truckload and car lots of good second hand 16 and 25 lb. rails.

ELECTRIC DRILLS

3—Dooley AC Electric coal drills, size 472 phase, 60 cycle, 220 volts.

1—Dooley Electric coal drill DC.

TIPPLE

1—Steel tipple complete with shaker and concrete silos. Capacity 1,000 tons per day.

DUCKBILLS

2—G30 Goodman Duckbills, DC.

LOADERS

1—8 BU AC Joy Loader, 3/60/220 Volts.

PIT CAR TRUCKS

200—Sets Sanford Day Timken roller bearing trucks, 42" gauge, with 14" diameter wheels.

We are distributors for John A. Roebling's Sons Company wire rope and fittings.

GAVENDA BROTHERS, Inc.

CANTON, ILLINOIS

OTTUMWA HOIST: cylindro-conical, 1" rope groove, hoisting range to 400', 150 HP AC 2300 volt motor, complete with all magnetic controls ready for operation, excellent condition.

PUMP: Fairbanks Morse, figure 5592, 2-stage, "Builtogether," with 30 HP motor and AP automatic primer, 175 gal./min. at 400 ft. total head, new condition, $350.

ELECTRIC CABLE: #8, 3 cond., 3000 volt, lead encased.

TRANSFORMERS: 2300/230 volt; 7½, 15, 25 and 37½ KVA.

LONGWALL CUTTING MACHINES: 2—Goodman L8DG3A, 50 HP, AC, 4 foot bar.

ELMIRA COAL COMPANY

Call W. E. Widmer, Tel. No. 866

Excelsior Springs, Mo.

Loading Machines

2—14 BU Joy, either high or low pedestal
1— 8BU, practically new.
1—8 BU, practically new.

Sub Stations

1—300 KW Westinghouse MG Set, 275 V, DC, 1200 RPM, 3/60/2300/4000 V, AC.
1—150 KW Westinghouse Rotary Converter with transformer.

Electric Locomotives

1—6 ton Jeffrey with MH 102 motors.
1—8 ton Jeffrey with MH 100 motors
1—8 ton G.E. HM 839 motors.
3—10 ton G.E. HM 809 motors.

Conveyors, Rubber

1—30" Joy 2000' between center.
1—26" Goodman, 97C, 1500 ft. between center.

Cutting Machines

3—35BB Shortwall.
2—512 EJ Shortwall
3—29U Top, etc.
2—7AU Top, etc.

Crushers

1—24"x20" Jeffrey Flextooth Coal Crusher, Uniform size coal.

TIPPINS MACHINERY CO.

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Pittsburgh 6, Penna.

MINE AND SLOPE HOISTS

1—20,000 # Allis-Chalmers, Dbl Drum
1—26,000 # Nordberg Sgl Drum
1—10,000 # Nordberg Sgl Drum AC
1—26,000 # Vulcan Sgl. Drum AC with MG Set Complete
1—11,000 # Wellman, Sgl Drum AC
1—16,000 # Allis-Chalmers Sgl Drum
1—30,000 # Allis-Chalmers Dbl Drum AC
1—7,000 # Flory Sgl Drum AC

CARPULLERS AND LOADERS

1—5000 # Jeffrey Carspotter AC
1—6000 # Brownie Carspotter AC
1—5000 # Link-Belt Carspotter AC
1—20,000 # Amer. Hoist Carspotter AC

CRUSHERS & MISC.

1—30x30 Link-Belt Dbl Roll
1—36x36 Jeffrey Sgl Roll
1—12x16 Eagle Dbl Roll
1—18x20 Eagle Dbl Roll
1—3 yd. Sauerman Scraper Bucket System

HAWKINS & CO.

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COMPLETE ELEVATORS • DRAG CONVEYORS • PAN & RECIPROCATING FEEDERS

ELEVATOR BUCKETS — WRITE FOR LITERATURE — CONVEYOR PULLEYS

IMMEDIATE DELIVERY — REDUCED PRICES

FRANK A. KREMSER AND SONS, INC.

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PHILADELPHIA 40, PENNA.

REgent 9-7272 REgent 9-7524

DIESEL GENERATORS

1—D-4400 Caterpillar Diesel Power Unit (less than 3,000 hrs.). V-belted to a 30 KVA Fairbanks Morse 220 volt, 3 phase Generator, complete with Exciter and switchboard.

BELT CONVEYORS

1—30", 70' long, new belt, complete with motor.
1—42", 20' long, complete with motor.

PIT CARS

150 Card Iron Works R.B. Pit Cars, 36" Gauge, 1.7 Ton Cap.
35 Card Iron Works R.B. Pit Cars, 36" Gauge, 1 Ton Cap.

PUMPS

1 HP. to 25 HP. I. R. Motor Mtd. Cent. Pumps.
4" & 8" Peerless Deep Well Pumps.
6" & 8" Hydroseal Slurry Pumps.
2" Wilfley Sand Pumps.

MOTORS — 440 Volts AC

1—50 HP. G. E. 900 RPM.
1—35 HP. G. E. 1200 RPM.
1—35 HP. G. E. 1800 RPM.
1—30 HP. G. E. 3550 RPM.
1—25 HP. G. E. 600 RPM.
1—25 HP. G. E. 1200 RPM.
1—20 HP. Westf. 860 RPM.
1—15 HP. U. S. BB 1200 RPM.
1—10 HP. Westf. 870 RPM.
1—10 HP. G. E. BB 1160 RPM.
1—10 HP. Westf. 1740 RPM.
2—10 HP. G. E. Vert. or Horiz., 1160 RPM, 440 volts.
1—50 HP. G. E. Slip-ring 1720 RPM., 2200 volts.
1—35 HP. Allis-Chalmers Slip-ring, 850 RPM, 440 volts.
1—60 HP. G. S. Slip-ring, 900 RPM, 2200 volts.
1—15 HP. Allis-Chalmers Slip-ring, 1150 RPM, 440 volts.
New and used fractional HP. Motors.

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BELT CONVEYORS FOR SALE

1—42" x 450' Robins Belt Conveyor with Robins anti-friction troughing and return idlers with dual drive gear reducer and 75 H.P. A.C. motor.

1—42" x 125' Robins Conveyor, same specifications.

Please send for details and low price.

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150 KW, 275 volts DC, West. (2)
150 KW, 275 volts DC, General Elec.
200 KW, 275 volts DC, Westinghouse
300 KW, 275 volts DC, Westinghouse
500 KW, 275 volts DC, Westinghouse

Complete with transformers and swbds.
NEW AC Motors—All sizes—Maximum discount.

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25 ton American Gas Locomotive Crane
40 ton Orton Diesel Locomotive Crane
30 ton Davenport Diesel Locomotive
50 ton Whitcomb Diesel Elec. Loco.
2½ yd. Bucyrus 54B shovel dragline
2 yd. Lorain diesel crane dragline, 100 ft. boom. Built 1948
20 yd. Koppel air dump cars. Std. ga.
1300 ft I-R 2 stage elec. air compressors
150 HP Kewanee portable boilers

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NEW — MOTORS — USED

7½ h.p. G.E. 500 v. 450/1350 r.p.m.
7½ h.p. G.E. 1 v.—600/1200 r.p.m.
7½ h.p. G.E. 220 v.—1150 r.p.m.
5 h.p. G-W Vertical, 220 v.—900 r.p.m.
5 h.p. G.E. v.—150/1800 r.p.m.
5 h.p. Westf. 220 v.—835 r.p.m.
1 h.p. G.E. 220 v.—535/3100 r.p.m.
1 h.p. G.E. 220 v.—1150 r.p.m.

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NEW—USED A. C MOTORS—ALL SIZES.

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Baker 5887

CONVEYORS

Belt, Bucket, Drag or Gravity
Shaker & Vibrating Screens
Truck Scales — Coal Crushers
Coal Drills — Car Spotters
Mine Fans — Electric Motors
Floor Cranes — Mining and Stripping Equipment

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THE INDUSTRIAL EQUIPMENT CORP.
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Pittsburgh 22, Pa.

R. T. McNEES

COAL MINE EQUIPMENT
NORTON, VIRGINIA

Hotel Norton — Phones 608 & 300

FOR SALE

Two-roll Link-Belt Crusher

Capable of reducing run-of-mine coal to 2"x0 at the rate of 350 tons per hour, complete with 220-volt motor and starter. The crusher can be adjusted to produce 2", 3" or 4"x0 coal. This equipment is as good as new.

INLAND STEEL COMPANY
Wheelwright, Kentucky

CARLYLE

INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

IMMEDIATE DELIVERY OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — HOSE, WATER, SUCTION, AIR, STEAM AND WELD-ING HOSE

SUCTION HOSE

Stock No CO-443-C

Heavy-duty, smooth bore, wire reinforced Suction Hose. Flexible and strong. For use in mines, sewers, trenches, etc., with diaphragm pumps, pressure pumps and other contractors equipment. Prices shown include I.P.T. Couplings attached to each length.

I. D. Size and Length	Price Per Length	I. D. Size and Length	Price Per Length
1¼"x10 ft.	$ 5.00√	2"x15 ft.	$35.50
1¼"x15 ft.	7.50√	2"x20 ft.	47.50
1¼"x20 ft.	10.00√	*2"x10 ft.	25.00√
1½"x10 ft.	6.00√	*2"x20 ft.	48.00
1½"x15 ft.	9.00√	*2½"x15 ft.	55.00√
1½"x20 ft.	14.00√	*2½"x20 ft.	90.00√
2"x10 ft.	12.00√	*3"x10 ft.	90.00
2"x15 ft.	22.75	*3"x15 ft.	135.00
2"x20 ft.	30.25	*3"x20 ft.	181.00
2½"x10 ft.	15.00√	*I.P.T. Nipples or Couplings attached to hose.	

DISCHARGE HOSE

Stock No CO-442-C

Cotton jacket, rubber lined hose suitable for water supply and discharge service. Constructed exactly like Fire Department hose. Light in weight. For pressures to 200 lbs. Attached to each length are Iron Pipe Thread Couplings.

Inside Diameter	Price Per 25 Ft. Length	Price per 50 Ft. Length	Price per 50 Ft. Length
1½"	$8.75√	$15.75	$21.75
2"	15.00	26.50	36.25
2½"	17.50√	25.00√	35.00
3"	25.75	34.25	47.50
4"	30.00√	48.00√	66.00√

HIGH PRESSURE HOSE

Stock No CO-440-C

2½" x 8 PLY DUCK AND CORD CONSTRUCTION SUITABLE FOR 400 LBS. WORKING PRESSURE.

For that difficult job where high pressures are encountered Carlyle offers this rugged flexible hose saving you over 50% in cost and giving dependable service for the following jobs—

* Jetting—Water, Air, Cement
* Hydraulic Grout
* Steam to 100 lbs. Pressure
* Oil Discharge

Low Priced at ..... $1.80 ft. √
Available in 10-15-25-50-50 ft. Lengths.
High Pressure Couplings attached as follows:

	Per Set
Male and Male ..... 2½"I.P.T.	$10.00
Female & Male ..... 2½"I.P.T.	12.00
Female & Female ..... 2½"I.P.T.	16.00

COMPRESSOR AIR HOSE

Stock No. CO-441-C

250 Lbs. Working Pressure. Heavy-duty extremely flexible. Pneumatic Air Hose. For all Air Tools, Compressors, Chippers, Riveters, Drills and Breakers. Each length complete with Universal Air Hose Couplings attached. These Couplings are quick snap and interchangeable with Air King, Chicago, Cleveland and others.

I.D. Size and Length	Price Per Length
¼"x25 ft.	$ 7.75
½"x50 ft.	14.00
¾"x25 ft.	9.25
¾"x50 ft.	17.00
1"x25 ft.	11.00
1"x50 ft.	20.50

√—*over stocked. Drastically reduced prices to move.*
Terms:—f.o.b.—N. Y. City—2%—10 days.

CARLYLE RUBBER CO., Inc.
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(1)—Page Diesel Dragline, Model 621-S, 2 Engines, Twin Electric Swings, 135 Ft. Boom, 7 Yd. Esco Bucket. New 1945. Price low for quick sale. Location—Southeastern Ohio.

(2)—Completely overhauled Caterpillar D8's with bulldozer attachments.

(1)—Completely overhauled Caterpillar D6 with hydraulic attachments.

(1)—10 Ton Huber Roller.

Write P. O. Box 631,
Zanesville, Ohio, for inspection.

FOR SALE

MODEL 621-S PAGE DIESEL DRAGLINE; equipped with 135' boom and 6 yd. bucket. Good condition.
MODEL 5-W BUCYRUS-ERIE ELECTRIC DRAGLINE; equipped with 100' boom and 6 yard bucket; new Westinghouse Engine.
170-B BUCYRUS-ERIE ELECTRIC 6 YARD SHOVEL. Pa. location.
MODEL 618 PAGE DIESEL DRAGLINE; equipped with 125' boom and 4 yd. bucket. Pa. location.
5-W BUCYRUS-ERIE DIESEL DRAGLINE; equipped with 100' boom and 5 yd. bucket.
MODEL K-595 LINK-BELT COMBINATION 2½ YD. SHOVEL & DRAGLINE; 1946 machine in good condition.
54-B BUCYRUS-ERIE DRAGLINE; 90' boom, 2½ yd. bucket; Buda diesel engine.
802 LIMA DRAGLINE; 75' boom, 2½ yd. bucket; Hesselman engine.
MODEL 3500 MANITOWOC SHOVEL with 45' boom, 34' stick, 2 yd. dipper, D-17000 Caterpillar engine; 16' 4" crawlers, 32" treads. Very fine condition.
37-B BUCYRUS-ERIE COMBINATION 1¼ YD. SHOVEL AND DRAGLINE.
2—42-T BUCYRUS-ERIE ELECTRIC BLAST HOLE DRILLS.

Frank Swabb Equipment Co., Inc.
Hazleton Nat'l Bank Bldg.
Hazleton, Pa. Telephone 4910

REBUILT MINING MACHINES

READY TO GO INTO SERVICE

3—112 A.A. Goodman Universal D.C.
4—112 UG.3A. Goodman Universal 220 Volts A.C.
3—112 G.3 Goodman Universal 220 Volts A.C.
4—50 H.P. Goodman Standards 220 V. A.C.
2—Goodman Track Cutting Machines 42 Inch Gauge A.C. 220 Volts.
2—Goodman Loading Machines 42 in. Gauge type 360D A.C. 220 Volts.
4—35B Jeffries Machines 250 Volts D.C.
1—35BB Jeffries Machines 220 Volts A.C.
6—CE Sullivan Machines A.C. and D.C.
2—7B Sullivan Machines 250 Volts D.C.
1—100 K.W. G.E. M.G. Set 1200 r.p.m. can be seen in operation.
1—Electric Hoist complete with 150 H.P. G.E. Motor.

LOCOMOTIVES

6—6 Ton G.E. Ball Bearing 42 Inch Gauge.
3—Goodman Caterpillar Trucks 220 Volts A.C.
4—8 BU Joy 36 and 42 Inch Gauge on Cats. A.C. and D.C.
4—5 BU Joys 42 Inch Gauge on Cats A.C. and D.C.
2—2 Lee Norse Six Ton Koal-Mobiles Model K.M.C 462.

THOMAS GILLESPIE
State Road 67 Bicknell, Ind.

Machinery for Sale as of Sept. 1, 1950

1—4 ton old style single armature Goodman Locomotive, 42" gauge.
1—6-ton G.E. Locomotive, 42" gauge.
5—32" gauge Wood Cars, 28" high, 1 yr. old, 1-ton cap.
12—42" gauge Steel Timken Bearing Cars, 30" high, good construction.
1—12AA Goodman Machine, good condition, new bar chain.
1—12 B.U.7B Joy Loader.
Numerous D.C. Motors from 5 to 18 h.p., all makes.
150 H.P. Fairbanks-Morse Engine and Gen., excellent condition.
1—T-D-9 International Tractractor—Diesel.

MASON MINES, Coshocton, Ohio

BARGAINS FOR SALE OR RENT

100 KW. Diesel Engine Generator Sets

11—100 kw. 250/275 V. cp. wd. D.C. Delco Generators dir-con. to 150 HP. GBD-8, 5¾x7, 8 cyl. Superior DIESEL Engines. Elec. starting, power panels and accessories.
3—100 kw., same as above with 220/440 V. New A.C. Generators.
1—60 kw. West. 250 V. D.C. dir. con. to NEW P.&H. Diesel Engine.
3—35 kw., 250 V. D.C. NEW GAS or GASOLINE Engine Generator Sets.
6—37½ kva. 220/440 V. 3 ph., 60 cy. NEW Gas or Gasoline, also Diesel Engine Generator Sets.

230 V. D.C. Motors

HP	MAKE	TYPE	SPEED
200	Westg.		[illegible]
175	G. E.	MD	[illegible]
150	Westg.	SK	[illegible]
125	G. E.	CD	[illegible]
125	Century	drip proof	1800
100	Westg.	SK-190	[illegible]
100	Westg.	S	[illegible]
75	G. E.	CDM	1800
60 NEW	G. E.	DC—splash proof	[illegible]
40 NEW	Westg.	SK-180	[illegible]

D.C. Generators—230-275 V.

KW	MAKE	TYPE	SPEED
250	Westg.		1200
200	Westg.	SK-210	[illegible]
150	Westg.	SK	[illegible]
110	Westg.	SK-190	[illegible]
100	Westg.	SK	720
100	Westg.	S	[illegible]
100	G. E.		900
75	Allis Chalmers		720
75	Westg.	S	[illegible]
75	Allis Chalmers		[illegible]
60 NEW	G. E.	CD	1150
40 NEW	Westg.	SK-183	1150

Transformers—1 ph. 60 cy.

No.	KVA	Make	PRIMARY	Sec.
2	500	G.E.	2300	220/440
4	333	Maloney	2300	220/440
3	200	G.E.	2400/4160Y	240/480
3	150	West.	2400/4160Y	240/480
3	150	Pgh.	2300	[illegible]
1	100	Peerless	[illegible]	[illegible]
3	75	West.	2300	220/440
1	75	West.	13200/6900	2300
3	37½	Packard	2300	115/230
3	25	Maloney	2300	115/230

Write for New Catalog

DUQUESNE ELECTRIC & MFG. CO.
PITTSBURGH 6, PA.

EQUIPMENT FOR SALE

Immediate Delivery:

Manitowoc shovel, Hyfront, Model 3500.
2 Manitowoc shovels, Model 3000, 3-way combination.
3 LeTourneau Super "C" Tournwagons. Excellent condition. Lima 802 shovel, Hyfront.
2 HD10 cable dozers.
Austin Western Grader, model 99M
Adams Grader, model 511.
McCarthy Horizontal core drill.
Complete coal tipple.
Terms if desired.

TESTA BROTHERS, INC.
925 Citizens Bldg., Cleveland 14, Ohio
Telephone: Cleveland Ohio—TOwer 10050
Gauley Bridge, W. Va., 201 W 1

2—Goodman Style G20B77 permissible Shaker Conveyors, latest type, with manual type HAD duckbill and 20 HP Westinghouse AC motor, 3 phase, 60 cycle, 220 volt, 1160 RPM.
without line troughs..............$2,400.00 each
with 300' new line troughs....... 4,300.00 each
The above equipment is to include all usual accessories and is guaranteed to be in A-1 condition. New in 1943. It is offered subject to prior sale, f.o.b. Sunnyside, Utah.

KAISER STEEL CORPORATION
Sunnyside Mine
Sunnyside, Utah

VIBRATING SCREENS
CRUSHERS — SCALES — FEEDERS
CONVEYORS — IDLERS

GUARANTEED EQUIPMENT
IMMEDIATE SHIPMENT

VIBRATING SCREENS

Eccentric weight types. Several in stock from 2' x 4' to 3½' x 8'. Priced from....................$425.00
Heavy duty eccentric shaft types. A few on hand, in excellent condition. Sizes from 3' x 8' to 5' x 14'. One to 4 decks. Priced with cloth from $1,465.00

COAL CRUSHERS

Double and single roll models. Types to produce ¾" stoker, and others to crush up to 8" resultant. Capacities from 15 to 500 tons per hour. Steel hoppers included. Priced from........................$425.00

HEAVY DUTY PLATE AND PAN FEEDERS

Complete with motor and drive.

15 to 25 ton per hour capacity...............$ 282.00
25 to 60 ton per hour capacity............... 500.00
50 to 100 ton per hour capacity............. 1207.00
100 to 175 ton per hour capacity............ 1584.00

TRUCK SCALES

15 ton Truck Scales........................$ 485.00
20 ton Truck Scales........................ 541.00
20 ton Truck Scales........................ 622.00
Others to 50 ton capacity. All scales complete with structural steel weighbridge. Parts and weighing beams for other makes of motor truck scales.

MINE CAR AND TIPPLE SCALES

Single and double track platforms.
Capacities 5 to 20 tons. Priced from.......$945.00

HEAVY DUTY FLIGHT CONVEYORS

Any length. Flights up to 8" x 24". All welded structural and sheet steel. Heavy duty, double guided chain. Prices from..................$195.00

PORTABLE FLIGHT CONVEYORS

Mounted on rubber tires and adjustable undercarriage. All welded structural and sheet steel; double guided heavy duty chain; steel flights to 6" x 24". Electric or gasoline power. Priced from...$450.00

CONVEYORS — PICKING TABLES

Troughing idler conveyors—picking tables. Any length, belt widths to 60". Prices from....$425.00

TROUGHING IDLERS AND ROLLERS

All steel. Interchangeable with other well-known makes. Replaceable precision ball bearings. No bearing adjustments required. Easy to start and will run in cold weather. Rust-proof ball races; maintenance is negligible.

3-roll Troughing Idlers for these sizes:

14" belt........$20.00	24" belt........$23.00
16" belt........ 21.00	30" belt........ 28.00
18" belt........ 22.00	36" belt........ 35.00
42" belt...............$38.00	

1-roll Return Idlers for these sizes:

24" belt........$ 9.00	36" belt........$10.50
30" belt........ 10.00	42" belt........ 11.50
48" belt...............$12.50	

PREFABRICATED CONVEYOR SECTIONS & ACCESSORIES

Build your own conveyor; we have in stock standard sections, head and tail pulleys, screw takeups, gravity takeups, troughing and picking idlers and return rollers, belting, drives, speed reducers, sheaves, etc. Phone us your order.

MOTORS — SPEED REDUCERS

500 in stock including DC motors and gearhead. All guaranteed. Priced from 50% of manufacturer's list.

BONDED SCALE & MACHINE COMPANY
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COAL AGE ADVERTISERS IN THIS ISSUE

MORE INFORMATION on any product advertised in COAL AGE may be easily secured by using the postage-free card facing p 124.

ADVERTISERS INDEX

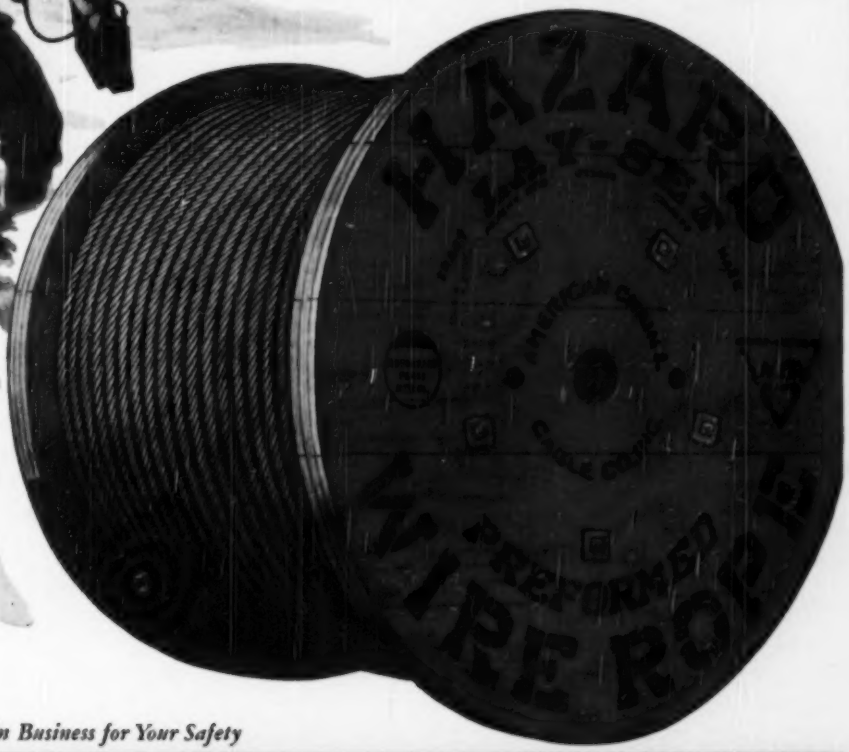
*Indicates that detailed information may be found in the 1949-50 MINING CATALOGS.

This index is published as a convenience to the reader. Every care is taken to make it accurate, but C. A. assumes no responsibility for errors or omissions.

2 signs of valuable "finds"

What's sweeter music to a "sourdough's" ears
than the bray of his burro? Why, it's the clicking of his
Geiger Counter telling him uranium's at hand . . .
and the louder it clicks the better the lode.
That's why prospectors today carry and count on the Geiger
to tell them when they've made a VALUABLE "FIND."

You don't need a Geiger Counter to hit the mother-lode
in wire rope value. Just look for the HAZARD REEL. It's the
sign of a wire rope that users everywhere recognize
and rely on for uniformity, longer service, easier handling
and utmost dependability. It's the sign of more
for your wire rope dollar . . . the sign of a VALUABLE "FIND."



ACCO *In Business for Your Safety*

AMERICAN CHAIN & CABLE
HAZARD WIRE ROPE DIVISION

TRADE MARK

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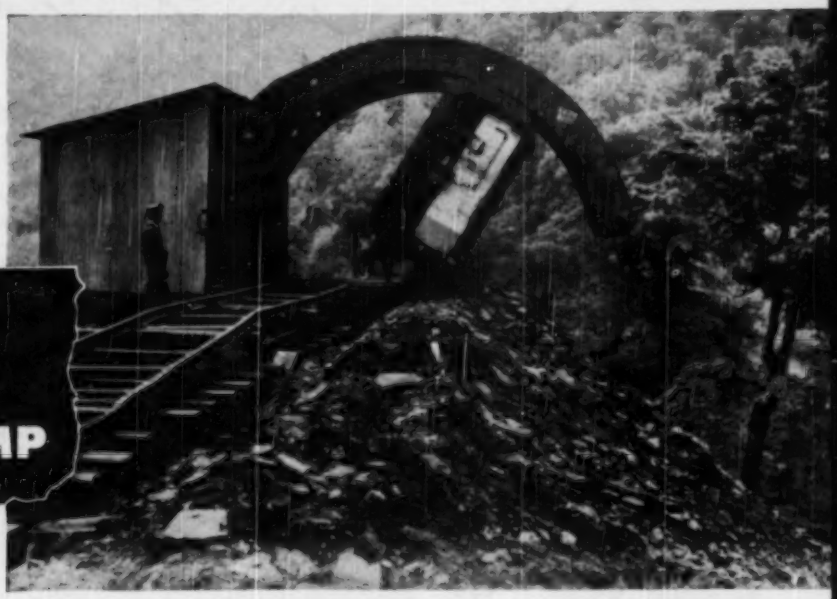
FAST, ECONOMICAL DISPOSAL of MINE REFUSE

LINK-BELT SIDE-TILTING REFUSE DUMP



Link-Belt Double-Arm Side-Tilting Dumper at a West Virginia coal mine. The mine-refuse car in dumping position tilts 160° from the horizontal for complete unloading. The cars weigh 8,600 pounds empty, and 40,600 pounds when loaded.

Unloading mine refuse with a Link-Belt Side-Tilting Dumper makes quick work of the job with a saving in mine operation costs. This method is applicable to a wide variety of dumping conditions. When a suitable hillside exists, the refuse cars can be taken through the dumper either by mine locomotive or by rope and capstan. Where the terrain will not permit the cars to return to the loading point through the dumper, the cars can be pushed into and pulled out of the dumper. In either case easy portability is provided as the dumper is movable on the mine car rails. Link-Belt Side-Tilting Dumpers are available in the single-arm and double-arm types to accommodate all sizes of cars.

If this method suggests refuse-handling economies for you, write our nearest office. Link-Belt engineers will be glad to give you full particulars on a side-tilting dumper to meet your conditions.

View showing mine locomotive placing a car in the Link-Belt Dumper for unloading. Cars are handled in and out of the dumper at the rate of approximately 20 an hour.

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Johannesburg. 12.180

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